



United Nations Conference on Trade and Development

Distr.
GENERAL

TD/B/CN.1/23
16 August 1994

Original: ENGLISH

TRADE AND DEVELOPMENT BOARD
Standing Committee on Commodities
Third session
Geneva, 31 October 1994
Item 2 of the provisional agenda

ADOPTION OF THE AGENDA AND ORGANIZATION OF WORK

Provisional agenda and annotations to the provisional agenda

Note by the UNCTAD secretariat

I. PROVISIONAL AGENDA

1. Election of officers
2. Adoption of the agenda and organization of work
3. Analysis of ways and means to improve market opportunities for commodities in the medium term, with emphasis on examination of the best ways of achieving diversification, taking into account competitiveness, market trends and opportunities
4. Identification of means by which the competitiveness of natural products with environmental advantages could be improved*
5. Reports of the subsidiary organs of the Standing Committee
6. Provisional agenda for the fourth session of the Standing Committee
7. Other business
8. Adoption of the report of the Standing Committee to the Trade and Development Board.

* It was agreed to avoid duplication of efforts.

II. ANNOTATIONS TO THE PROVISIONAL AGENDA

Item 1: Election of officers

Rule 18 of the rules of procedure of the main Committees of the Trade and Development Board states that: "At the commencement of the first meeting of each regular session, the Committee shall elect a Chairman, five Vice-Chairmen and a Rapporteur from among the representatives of its members. These officers shall constitute the Bureau of the Committee. In electing the officers, due account shall be taken of the need to ensure an equitable geographical distribution." Moreover, rule 19 states that "the Bureau of the Committee shall consist of seven members, including four members from Groups A and C combined, two members from Group B and one member from Group D, referred to in the annex to General Assembly resolution 1995 (XIX) as amended".

Item 2: Adoption of the agenda and organization of work

The provisional agenda in section I above was approved by the Standing Committee on Commodities at its second session (see TD/B/40(2)/13, annex II). As provided for in the UNCTAD calendar of meetings, the Standing Committee will have available five working days from 31 October to 4 November 1994. Throughout the session, interpretation facilities will be available for one meeting in the morning and one meeting in the afternoon. At its 10th (opening) meeting on 31 October 1994, an opening statement will be made by the Officer-in-Charge of UNCTAD or his representative. The rest of the third session of the Standing Committee will be mainly devoted to items 3, 4 and 5 of the provisional agenda.

Item 3: Analysis of ways and means to improve market opportunities for commodities in the medium term, with emphasis on examination of the best ways of achieving diversification, taking into account competitiveness, market trends and opportunities

For the consideration of this item, the Standing Committee will have before it a report by the secretariat entitled "Improving market opportunities for commodities in the medium term, with emphasis of achieving diversification" (TD/B/CN.1/24). The report briefly examines the market trends for commodities and the evolution of export diversification in developing countries. It then analyses the relationship between various national policies and competitiveness and opportunities for diversification, as well as international support policies affecting market opportunities for commodities. The report includes some suggestions for consideration by the Committee for actions to assist, in particular, developing countries that remain highly dependent on a limited number of commodities for their export earnings.

Item 4: Identification of means by which the competitiveness of natural products with environmental advantages could be improved

With a view to assisting the Standing Committee in examining this item, the secretariat has prepared a study entitled "Identification of means by which the

competitiveness of natural products with environmental advantages could be improved: reducing the environmental stress of consumption without affecting consumer satisfaction" (TD/B/CN.1/25). The study aims to provide initial information on natural products with claims to environmental advantages and to establish a basis for action to increase their competitiveness. It focuses on products with supply potential from developing countries.

Item 5: Reports of the subsidiary organs of the Standing Committee

Under this item the Standing Committee will have before it the reports of the Intergovernmental Group of Experts on Tungsten on its second session, held from 8 to 10 November 1993 (TD/B/CN.1/18 - TD/B/CN.1/TUNGSTEN/8) and the report of the Third Ad Hoc Review Meeting on Bauxite, held from 2 to 3 May 1994 (TD/B/CN.1/20 - TD/B/CN.1/RM/BAUXITE/9).

Item 6: Provisional agenda for the fourth session of the Standing Committee

It is recalled that the first session of the Standing Committee on Commodities (see TD/B/39(2)/4 - TD/B/CN.1/6, paras. 80 and 81) decided that "the work programme agreed at its first session should provide the content for its agendas". It further agreed that "the choice of the specific agenda topics within the main headings of the work programme would be determined in the informal consultative mechanism established in accordance with paragraph 83 of the Cartagena Commitment, taking into account the evolution of the world commodity situation and progress in the work of the secretariat". The Standing Committee may wish to consider this issue in the light of the experience of the third session, and bearing in mind resolution 352(XXXIV) of the Trade and Development Board."

Item 7: Other business

Under this item the Chairman of the Ad Hoc Group of Experts on Risk Management in Commodity Trade will report to the Standing Committee on the proceedings of the Ad Hoc Group for information and possible action.

Item 8: Adoption of the report of the Standing Committee to the Trade and Development Board

The report of the Standing Committee will be considered by the Trade and Development Board at the pre-session executive session to the second part of the forty-first session, scheduled to be held from 27 March to 7 April 1995.

" By its resolution 352(XXXIV), of 20 November 1987, the Board endorsed the report of the Ad Hoc Intergovernmental Working Group on the In-Depth Study of the United Nations Intergovernmental Structure and Functions in the Economic and Social Fields (TD/B/1154). The report specified, *inter alia*, that only one document of 24 pages should be prepared by the secretariat for each substantive agenda item, and that background documentation should be made available if requested and agreed to by member States.



United Nations Conference on Trade and Development

Distr.
GENERAL

TD/B/CN.1/24
11 August 1994

Original: ENGLISH

TRADE AND DEVELOPMENT BOARD
Standing Committee on Commodities
Third session
Geneva, 31 October 1994
Item 3 of the provisional agenda

ANALYSIS OF WAYS AND MEANS TO IMPROVE MARKET OPPORTUNITIES FOR COMMODITIES
IN THE MEDIUM TERM, WITH EMPHASIS ON EXAMINATION OF THE BEST WAYS
OF ACHIEVING DIVERSIFICATION, TAKING INTO ACCOUNT COMPETITIVENESS,
MARKET TRENDS AND OPPORTUNITIES

Improving market opportunities for commodities
in the medium term, with emphasis on achieving diversification

Report by the UNCTAD secretariat

CONTENTS

<u>Chapter</u>	<u>Paragraphs</u>
I. MARKET TRENDS FOR COMMODITIES AND THE EVOLUTION OF EXPORT DIVERSIFICATION IN DEVELOPING COUNTRIES	1 - 11
II. NATIONAL POLICIES: COMPETITIVENESS, MARKET OPPORTUNITIES AND DIVERSIFICATION	12 - 42
A. National policies designed to provide economic incentives	13 - 20
B. National policies designed to improve the capability of market participants to respond to economic incentives	21 - 28
C. Ways and means for a country to find market opportunities for its commodities	29 - 42
III. INTERNATIONAL POLICIES AFFECTING MARKET OPPORTUNITIES FOR COMMODITIES AND OPPORTUNITIES FOR DIVERSIFICATION . .	43 - 60
A. Ways and means of increasing the market opportunities for commodities in the medium term	43 - 50
1. Market access	43
2. Improving information on demand and market requirements	44 - 45
3. Generic promotion of commodities	46 - 48
4. Promotion of new end-uses of commodities	49 - 50
B. Support for diversification	51 - 58
C. Conclusions	59 - 60

Chapter I

MARKET TRENDS FOR COMMODITIES AND THE EVOLUTION OF EXPORT DIVERSIFICATION IN DEVELOPING COUNTRIES

1. The evolution of commodity prices as well as of supply and demand for commodities over the last few years has recently been discussed in several documents¹ and will therefore not be addressed in detail here. The main conclusions of these documents include (i) that real commodity prices declined by about 50 per cent between 1980 and the beginning of the 1990s; (ii) that the price fall in agricultural commodities accounted for the bulk of the drop in the aggregate price index; (iii) that beverages constituted the commodity group experiencing the sharpest drop in prices;² (iv) that tropical timber was the only individual commodity for which price increases could be observed; (v) that the major cause for the general price fall lay in substantial increases in the supply of commodities, even though sluggish demand in industrial countries may also have contributed; (vi) that the major part of the supply increase came from the developed world, rather than from the developing or highly indebted countries; and (vii) that the increase in aggregate commodity prices over the last few months suggests that the downward trend in commodity prices may have bottomed out, at least temporarily.

2. The impact of a decline in the price of commodity exports on the real value of a country's earnings from those exports depends on the development of the volume of commodity exports. Evidence given by figure 2 suggests that the volume of non-oil commodity exports from developed countries as well as from developing countries in Asia has risen, to the extent that these countries achieved a substantial increase in the real value of their non-oil commodity export earnings despite the drop in prices. Countries of Developing America have by and large maintained the real value of their non-oil commodity exports despite the sharp drop experienced in the mid-1980s, while the commodity price decline of the last 20 years has led to a substantial decrease in the real value of non-oil commodity exports from African countries as a group, since the volume of such exports from these countries has declined as well, as suggested by figure 3.³ Figures 4 to 6 suggest that the export volume of agricultural raw materials and of minerals and metals⁴ from African countries has dropped, while the volume of food exports from these countries has registered a slight increase over the last 20 years. However, the increased volume of food exports has not translated into a substantial increase in their real value because food was the commodity group

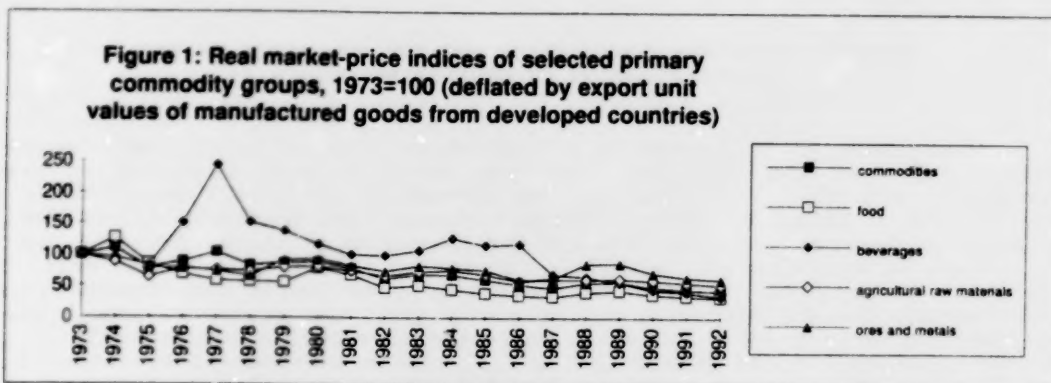
¹ See, for example, UNCTAD, "The commodity situation, developmental linkages between the commodity sector and other sectors, and actions required to develop such linkages in the context of diversification" (1994), forthcoming as a General Assembly document and World Bank, *Global economic prospects and the developing countries* (Washington, D.C., 1994).

² See figure 1 for evidence on these conclusions.

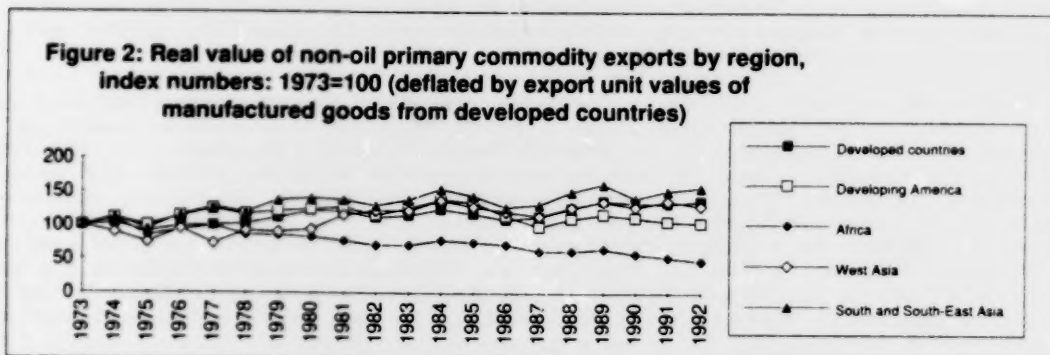
³ It should be noted that evidence from figures 3 to 6 can give only a rough idea of the trends in the volume of commodity exports as volume indices have been calculated using the same four price indices (for non-oil primary commodities as a group, for food, for agricultural raw materials, and for minerals and metals) for all groups of countries. More disaggregated data are not available to date.

⁴ It would appear that the enormous percentage increase in the export volumes of minerals and metals that countries from West Asia have achieved over the last ten years has not had a major impact on the markets, as the market shares of these countries are very small. On the other hand, this development illustrates the success these countries have had in using their large energy resources as secondary inputs for the energy-intensive processing of imported metal ores, for example, for the production of aluminum.

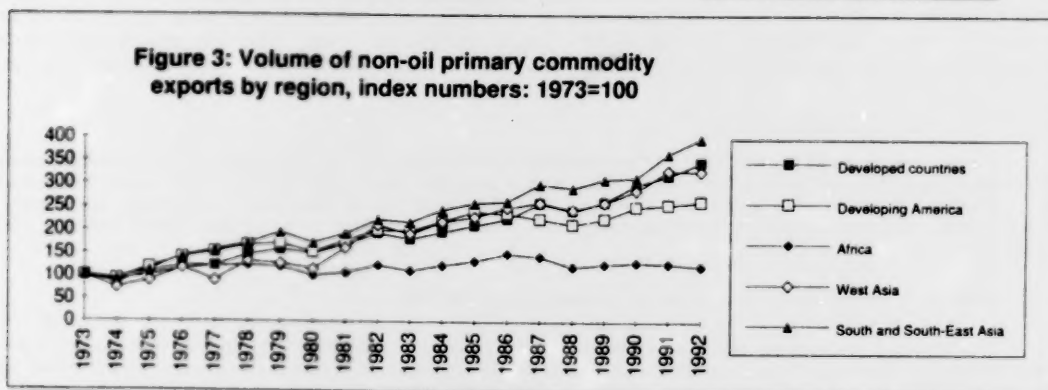
that experienced the sharpest decline in prices over the same period (see figure 1).⁵



Source: UNCTAD database.



Source: Nominal values from UNCTAD Commodity Yearbook, price indices from UNCTAD Commodity Price Bulletin.



Source: Nominal values from UNCTAD Commodity Yearbook, price indices from UNCTAD Commodity Price Bulletin.

⁵ Note that countries which have a large market share in the export of a specific commodity may be faced with an "adding-up" problem, meaning that an increase in the volume of these exports would cause a drop in prices. Some African countries, in particular those exporting cocoa, may be among this group of countries.

Export volume indices by region and commodity groupings

Figure 4: Food

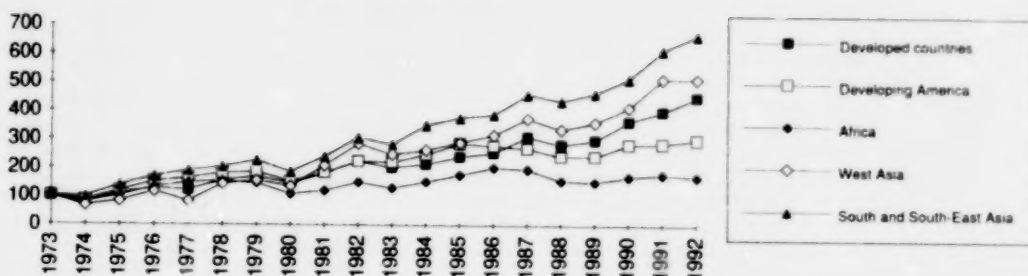


Figure 5: Agricultural raw materials

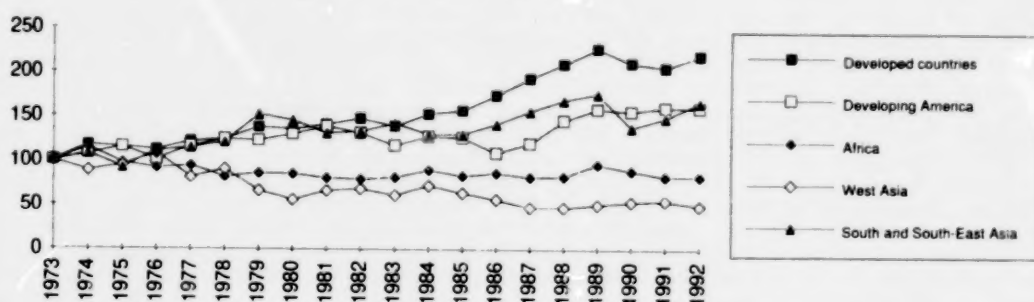
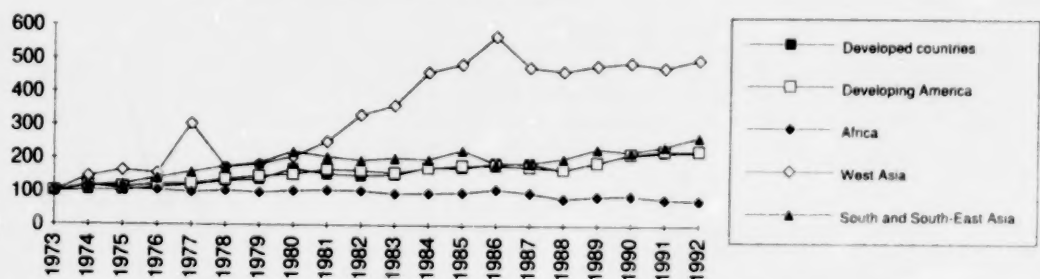


Figure 6: Minerals and metals



Source: Nominal values from UNCTAD Commodity Yearbook, price indices from UNCTAD Commodity Price Bulletin.

3. Several developing countries have successfully diversified their export structure both out of commodities and within the commodity sector since the end of the 1970s.⁶ The extent of this reduction of dependence on the commodity sector and, in particular, on a small number of commodities in their export earnings has, however, varied considerably. Developing countries in South and South-East Asia as well as, to a lesser extent, those in Latin America and North Africa were relatively successful in this respect, while little improvement, or in some cases even a deterioration, has taken place in many sub-Saharan African and the South Pacific countries. The experience of successfully diversifying countries⁷ indicates that there is no unique recipe to be followed by all countries. Rather, it appears that successful diversification is the outcome of the interplay of several interrelated factors including external and domestic policy conditions. Certain basic factors such as natural resource endowment, geophysical and climatic characteristics and the size of the domestic markets, while setting a limit to the development of diversification activities, do not seem to be decisive barriers. By contrast, establishing a conducive economic environment in the domestic economy to enhance competitiveness and backing this up by appropriate legislative and other supportive measures, in particular those encouraging private-sector initiatives, seems to be common to all successful diversification experiences.

4. Table 1.1 provides statistical evidence on the interrelationship between export dependence and selected economic indicators. Data on dependence are presented as three-year averages for the periods 1979-1981 and 1989-1991; data for the selected economic indicators are presented as five-year averages for the periods 1977-1981 and 1987-1991, except for school enrolment figures for which different periods have been selected to take account of the time lag between the acquisition of knowledge at school and its use. Given that many developing countries started economic reform in the first half of the 1980s, the first period can be considered a pre-adjustment period and the second period one of adjustment or post-adjustment. The group of 59 countries selected for this analysis consists of 25 developing countries from Africa, 15 countries from Developing America, and 19 developing countries from Asia; 16 least developed countries are among these countries. The selected group is divided into five subgroups according to the countries' diversification experience varying from very successful diversification to significantly increased dependence. Within these subgroups, the countries are ordered according to GDP growth in the second period in an effort to examine whether diversification follows from growth and whether countries that have grown vigorously have substantially reduced export dependence.⁸

5. Columns (2) and (3) of the table show that 25 of the selected developing countries achieved a significant reduction in their export dependence, whereas the situation worsened for 13 countries and no significant change occurred in 21 countries. It is noteworthy that 8 out of the 11 countries which had a dependence of 40 or less per cent in the first period were successful in further reducing their dependence, sometimes significantly, or in maintaining their low level of dependence, and that India and Zimbabwe are the only countries in this group which experienced a significant increase in dependence. By contrast, in

⁶ See table 1.1. Diversification within and out of the commodity sector reduces a country's vulnerability to sector-specific adverse changes on world commodity markets. As a reduction of this vulnerability can be considered the basic objective of diversification, a country's dependence on a limited number of commodity sectors appears to be a more meaningful measure of diversification than dependence on the commodity sector as a whole.

⁷ For evidence, see UNCTAD: *Analysis of national experiences in horizontal and vertical diversification, including the possibilities for crop substitution*, TD/B/CN.1/14, 14 September 1993.

⁸ World Bank: *Global economic prospects and the developing countries*, Washington, D.C. (1994) p. 34.

Table 1.1: The interrelationship between a country's export dependence on its three main commodities and selected economic indicators

Country or territory	Dependence on three main commodities 1)		General economic indicators					Economic indicators related to saving and investment					Economic indicators related to the availability of foreign exchange					
	1979-81	1989-91	GDP growth rate	per capita GDP	Secondary school enrolment	National savings rate	Investment-GDP ratio	Foreign direct investment (mn US\$)	Debt service/foreign exchange earnings ratio	Terms-of-trade index 1970=100	1977-81	1987-91	1977-81	1987-91	1977-81	1987-91		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Dependence reduced by 10 or more percentage points																		
Singapore	33	20	9.0	8.9	5060	8897	54	67	34	44	42	38	775	3041	2	1	n.a.	n.a.
Malaysia	52	30	7.6	8.4	1674	2279	46	52	29	29	29	28	736	1843	6	13	148	114
Hong Kong	29	14	10.8	6.6	4700	8269	52	70	30	34	33	29	n.a.	n.a.	2	2	n.a.	n.a.
Indonesia	75	50	8.1	6.5	434	586	21	40	29	31	23	34	211	844	13	34	323	249
Ghana	85	65	1.1	4.8	591	523	36	39	6	9	7	12	12	12	7	43	128	59
Syrian Ar. Rep.	89	57	6.3	4.5	1583	1487	44	57	15	6	28	16	n.a.	n.a.	16	24	111	74
Tunisia	80	56	6.1	4.3	1021	1170	22	36	23	19	30	22	151	85	16	28	455	305
Philippines	38	25	5.2	3.8	654	599	58	66	27	19	29	20	77	576	19	29	64	64
Colombia	68	56	4.9	3.8	1138	1319	41	45	20	22	19	19	98	383	14	41	128	85
Bolivia	68	55	1.5	3.6	990	737	31	36	14	3	19	12	33	15	32	52	220	143
Mexico	66	40	7.4	2.9	2382	2311	37	53	19	18	26	21	1441	2474	56	33	163	125
Egypt	86	69	8.7	2.8	850	1145	45	62	20	4	30	29	579	850	28	43	112	81
Madagascar	73	55	0.1	1.0	345	267	14	35	0	1	12	13	n.a.	n.a.	11	47	101	73
Argentina	46	35	1.2	0.6	2533	2145	56	65	22	10	21	9	483	1286	27	42	75	56
Cote d'Ivoire	71	53	4.0	-1.4	793	597	14	19	12	0	27	11	60	54	22	62	126	83
Cameroon	71	46	13.0	-6.2	654	734	15	23	10	13	24	28	75	-12	11	21	114	80
Dependence reduced by between 9 and 5 percentage points																		
Thailand	37	30	7.3	10.6	589	999	27	30	20	27	27	32	136	1428	13	17	99	80
Korea Rep.	33	25	6.4	9.5	1619	3265	61	88	25	36	32	34	41	249	13	16	89	89
Uganda	98	91	-3.4	6.0	251	251	4	9	0	3	5	11	n.a.	n.a.	8	64	87	85
Kenya	64	57	6.8	4.9	317	335	15	20	17	16	27	24	50	36	13	37	128	86
Jamaica	82	73	-1.4	4.3	998	973	58	59	12	16	17	27	-9	73	18	38	106	96
Bangladesh	85	78	5.0	3.9	137	164	22	18	4	6	13	12	n.a.	2	13	34	70	60
Venezuela	94	88	1.6	3.9	4359	3691	40	46	33	22	33	19	78	389	17	25	336	235
Morocco	60	51	2.6	3.8	551	624	18	32	15	21	27	23	58	159	34	40	122	132
Fiji	69	64	4.9	2.3	1778	1762	61	53	20	14	29	16	20	32	4	12	n.a.	n.a.
No significant change in commodity dependence																		
Cyprus	36	35	8.5	6.4	2726	4459	95	95	21	25	36	27	66	75	8	22	69	55
Nigeria	94	97	0.0	5.9	1241	1010	10	29	24	12	25	10	152	832	6	27	428	297
Turkey	39	41	2.0	4.7	971	1209	32	40	17	22	18	23	50	521	23	37	n.a.	n.a.

Table 1.1: The interrelationship between a country's export dependence on its three main commodities and selected economic indicators

Paraguay	76	74	10.7	4.4	1197	1262	22	30	21	19	28	24	31	37	13	19	87	78
Burundi	87	90	5.1	4.1	224	252	3	4	4	1	14	16	n.a.	1	5	43	n.a.	n.a.
Guinea	95	93	1.3	4.0	366	271	14	13	n.a.	8	n.a.	19	n.a.	n.a.	25	22	n.a.	n.a.
Solomon Isl.	79	82	n.a.	3.9	n.a.	n.a.	n.a.	n.a.	10	8	n.a.	32	3	10	4	12	n.a.	n.a.
Guatemala	48	50	4.4	3.5	1675	1395	13	18	15	8	19	13	116	139	7	32	89	64
Gambia	77	74	3.0	3.5	284	306	11	17	-1	4	25	18	n.a.	n.a.	4	21	89	60
Ecuador	78	82	5.4	2.6	1723	1663	42	55	20	13	26	21	55	80	22	35	363	293
Uruguay	46	42	4.1	2.6	1936	2018	61	70	18	14	16	13	150	n.a.	23	40	88	82
Senegal	66	66	-0.6	2.6	408	411	10	13	-1	4	17	12	11	n.a.	13	33	127	115
Papua N. Guin.	68	71	1.8	2.0	736	694	12	11	9	2	22	25	48	143	6	32	n.a.	n.a.
Zambia	94	93	0.4	1.1	402	305	16	17	9	2	21	12	23	114	22	18	42	42
Brazil	36	33	4.3	0.7	1711	1799	29	35	18	22	23	22	1930	964	56	28	120	103
Niger	95	91	6.9	0.7	293	206	3	5	11	0	30	14	30	n.a.	12	39	69	59
Algeria	99	98	5.2	0.2	2376	2360	24	46	38	25	44	31	126	-8	28	57	425	304
Cent. Afr. Rep	75	74	-0.7	-0.1	289	244	9	15	-4	-6	10	12	8	-3	3	15	120	102
Zaire	76	73	-0.1	-1.5	252	212	18	34	4	8	20	11	n.a.	n.a.	12	34	58	49
Jordan	40	40	10.6	-1.6	1224	1326	67	79	40	7	36	23	55	18	16	32	105	87
Peru	41	45	3.3	-2.7	1002	829	49	62	19	17	23	20	60	30	34	17	70	56
Dependence increased by between 5 and 9 percentage points																		
Botswana	88	94	11.5	9.6	696	1353	18	26	12	20	35	27	76	55	11	4	n.a.	n.a.
Tanzania U. Rep	49	56	1.5	4.0	353	323	4	3	14	1	25	37	n.a.	n.a.	12	37	111	74
Gabon	90	96	-6.3	0.8	4597	3020	17	17	44	23	38	30	38	19	21	12	478	404
Dependence increased by 10 or more percentage points																		
Chile	57	68	7.9	6.6	1082	737	49	64	12	16	19	19	204	273	42	28	44	40
Pakistan	58	71	6.5	5.8	243	328	15	17	14	20	18	19	55	191	23	35	77	59
India	25	39	4.6	5.5	237	322	27	37	22	21	22	25	n.a.	n.a.	12	27	73	70
Nepal	52	69	3.2	5.4	138	157	14	24	14	11	17	21	n.a.	n.a.	3	15	n.a.	n.a.
Honduras	62	74	5.6	3.6	875	804	18	33	14	11	25	21	11	45	13	38	92	77
Sri Lanka	63	73	5.7	3.5	376	399	48	61	15	15	24	23	28	41	9	25	114	79
Burkina Faso	67	88	3.5	3.2	167	192	2	4	0	5	20	22	2	n.a.	7	15	87	85
Zimbabwe	31	50	3.4	3.0	532	563	9	36	13	18	16	21	1	-9	2	17	n.a.	n.a.
Dominican Rep	56	72	4.4	1.5	712	717	37	55	19	15	24	25	65	117	18	16	79	71
Benin	69	80	5.7	1.2	231	242	10	19	2	5	21	14	3	n.a.	9	10	65	58

Note:

1) Commodities considered for calculating dependence are primary commodities including fuels (SITC sections 0-4 (less groups 233, 244, 266, 267), division 68 and item 522.56) plus precious stones and non-monetary gold, as well as semi-processed and processed forms of leather, rubber articles, veneer sheets, plywood and other wood articles; paper and paperboard; silk yarn and fabrics; cotton yarn, fabrics and clothing; jute products; and steel.

Data sources:

Columns (2) and (3) UNCTAD database. Columns (4) to (7) and columns (16) to (19) from UNCTAD Handbook of International Trade and Development Statistics, tables 6.1, 6.2, 5.14, and 7.2. Columns (8) and (9) from World Bank. Columns (10) to (15) from International Financial Statistics, except for investment data for Bangladesh, Burkina Faso, Central African Republic, Gambia, Guinea, Hong Kong, and Madagascar which are from World Bank.

Table 1.2: Correlation coefficients

Dependence®	GDP growth		per capita GDP		Secondary school enrolment	
	1977-1981	1987-1991	1977-1981	1987-1991	1977-1981	1987-1991
1979-1981	-0.29	-0.18	-0.17	-0.34	-0.43	-0.46
1989-1991	-0.38	-0.17	-0.28	-0.45	-0.54	-0.57
Dependence	National savings rate		Investment		Foreign direct investment	
	1977-1981	1987-1991	1977-1981	1987-1991	1977-1981	1987-1991
1979-1981	-0.28	-0.46	-0.11	-0.31	-0.24	-0.32
1989-1991	-0.41	-0.51	-0.17	-0.29	-0.39	-0.51
Dependence	Debt service/foreign exchange earnings ratio		Terms of trade index			
	1977-1981	1987-1991	1977-1981	1987-1991		
1979-1981	-0.04	0.28	0.44	0.40		
1989-1991	-0.12	0.13	0.33	0.33		
Note: A negative sign of the correlation coefficient means, for example, that those countries which had a higher growth rate than others also had a lower level of dependence than other countries.						

the group of 8 countries which had a dependence of 90 or more per cent in the first period, only two (Uganda and Venezuela) experienced a significant reduction in dependence; however, these countries are still highly dependent. This suggests the presence of a self-perpetuating momentum in dependence and diversification, with the result that a well-diversified economy is often a springboard for further diversification and that excessive dependence tends to prolong dependence.

6. Table 1.2 presents the correlation coefficients regarding dependence and the selected economic indicators. Given that such coefficients can not indicate directions of causality, and ignore the interplay among variables, any conclusions drawn have to be based on plausibility and treated as tentative only. A general observation, however, is that developing countries with high growth rates (columns (4) and (5)) have been more successful in reducing dependence than others. The notable exceptions from this pattern are Botswana and Chile. Whereas no strong causal relationship can be established on the basis of this parallel evolution of high GDP growth and reduced export dependence, the correlation coefficients suggest the presence of a slight positive influence of high GDP growth in the first period on reduced dependence in the second period.

7. It would appear, however, that this evidence does not imply that growth alone is a springboard for diversification. Cote d'Ivoire and Cameroon, for example, have reduced dependence significantly but experienced severe setbacks in their growth performance. Although these countries suffered a significant adverse movement in their terms of trade (columns (18) and (19)), their external economic environment did not worsen more than that of, for example, Bolivia, Colombia or Ghana, i.e., countries with a much more favourable growth experience.

The latter countries, however, initiated economic reform earlier and with a better resolve, with the result that their economies were more flexible in adjusting to external shocks. It is also interesting to note that several countries (Brazil, Jordan, and Peru) with low dependence in the first period experienced low growth in the second period. These countries faced a sharp drop in foreign direct investment as well as a drop in domestic investment between the first and the second period. Whilst this outcome could indicate that diversification hampers growth, it seems more plausible that these countries' experience highlights the importance of sustained strong investment for continued growth.

8. Chile appears to be an example of a country that has succeeded in exploiting its comparative advantage in the commodity sector and in building buoyant growth on dynamic parts of the sector (in particular on fisheries and fruit). Further examples of countries which obtained strong GDP growth on the basis of the strong export performance of parts of their commodity sector, be they traditional or non-traditional commodities of the respective economies, include Thailand (fisheries), Indonesia (tropical timber), Ghana (tropical timber and bauxite/aluminium), Kenya (horticultural products and tea), Uganda (cotton and cereals), and Colombia (horticultural products and coal). This suggests that both high growth and export diversification are often the result of a strong, sometimes traditional, commodity sector.

9. Regarding other general economic indicators, the tables show that most successfully diversifying countries are middle-income countries (columns (6) and (7)) and that school enrolment figures (columns (8) and (9)) are on average higher in these countries than in others. The former finding points to the importance of an adequate size of the domestic market as a basis for export activities, while the latter highlights the importance of a high general level of education for taking advantage of market opportunities. The data also suggest that higher national savings rates (columns (10) and (11)) and, to a much lesser extent, investment to GDP ratios (columns (12) and (13)) are positively correlated with diversification. In addition, successful diversification appears to be positively correlated with a high level of foreign direct investment (columns (14) and (15)). This could indicate that attracting foreign investors allows for the import of new production and marketing methods conducive to diversification, provided that these methods can be adapted by the domestic economy. It is also noteworthy that foreign direct investment tends to be concentrated in a few countries, mainly middle-income countries in East Asia and Latin America. The correlation coefficients give some evidence suggesting that high foreign direct investment occurred before diversification took place, while increased investment to GDP ratios seem to have materialized parallel with or after diversification. However, the empirical basis for this conclusion is relatively weak, calling for further research in this area.

10. Regarding data on the availability of foreign exchange, there appears to be no correlation between dependence and high debt-service payments in ratio to foreign-exchange earnings from the export of goods and services (columns (16) and (17)). Data on the evolution of the countries' terms-of-trade index (columns (18) and (19)) suggest that, excluding oil exporters, unsuccessful diversifiers have experienced a long-term decline in their terms of trade, evidenced by the fact that the figures are lower than 100 in both periods. By contrast, the index for most successful diversifiers was higher than, or close to, 100 in at least the first period. This suggests that the persistence of favourable market prices of a country's export commodities provides a good stimulus to diversification.

11. Two broad conclusions may be drawn on the basis of this evidence. Firstly, given that those countries that have been most successful in export diversification, i.e., countries from East Asia and Developing America, are among those that have increased the volume of non-oil commodity exports the most, it would appear that a strong commodity sector is a good basis for export diversification. This suggests that diversification within, as well as out of, the commodity sector is an important factor in success. Secondly, problems on

the supply side and a lack of competitiveness in the commodity sector may have been an important reason for the poor economic performance of African countries as a group over the last few years. This may lay the basis for the presumption that reform of national policies designed to improve the competitiveness of the commodity sector is a condition for an improved economic performance of African countries in the future.

Chapter II

NATIONAL POLICIES: COMPETITIVENESS, MARKET OPPORTUNITIES AND DIVERSIFICATION

12. Ways and means for countries to improve their competitiveness and opportunities for diversification are often identified with progress in the organization of and techniques employed in the production process. It has, however, increasingly been recognized that adopting a marketing policy which ensures that identified export markets can be penetrated and maintained is a necessary complement to being competitive in terms of production processes. Non-price factors, such as access to the required information or the development of an export association which is considered a reliable counterpart in international trade, therefore need to be taken into account. This chapter will discuss national policy reform designed to raise a country's competitiveness in the production process before its focus turns to the marketing side of export diversification.

A. National policies designed to provide economic incentives

13. A large number of developing countries have embarked on economic reform since the beginning of the 1980s. Pursuing national policies designed to improve the country's competitiveness^{*} is often considered as the major determinant for a more successful performance; this was the case for the East Asian countries. By contrast, the absence of policies that encourage export diversification or the increase of foreign-exchange reserves in order to smooth the impact of adverse external shocks is likely to magnify the negative impact of the difficult external environment on domestic economic performance and diversification; this appears to have been the case for many developing countries in sub-saharan Africa and the South Pacific. Given that policies designed to raise competitiveness affect all economic agents, be they active in the commodity sector or not, the key aspects of these general policy measures merit a brief discussion.

14. Although there have been substantial differences from country to country in the speed and intensity as well as in the mix and range of policy instruments used in economic reform, countries have tended to apply a common set of macroeconomic measures, trade policy reforms and other liberalization measures. Demand management measures including currency devaluation and fiscal restraint have usually marked the start of economic reform. These measures were then reinforced on the supply side by microeconomic and institutional reforms concentrating on liberalization of the country's external trade regime, its price and marketing systems in domestic agriculture and industry, and its financial sector. A key assumption of this reform strategy has been that "getting the prices right" would trigger a supply response that would eventually lead to a sustainable economic performance.

^{*} An increase in a country's competitiveness is reflected in its ability to raise its share of export markets, or to sustain a relatively higher rate of growth of domestic demand without a deterioration in its current-account balance (e.g., caused by sourcing higher domestic demand by increased imports or financial inflows).

15. The real exchange rate is a crucial price in any economy as it has a major influence on a country's opportunities for exports and on the returns to domestic producers. Almost all developing countries experienced a depreciation of their real exchange rate during the 1980s with the vast majority starting the process of exchange-rate adjustment in the first half of the decade. Although concurrent devaluations may have been ineffective in improving external competitiveness, they have changed the relative price between the tradable and non-tradable sectors in the domestic economy, thus strengthening domestic agriculture. Taxation of the agriculture sector implied by exchange-rate overvaluation can, in fact, be considered as having been a major obstacle to diversification out of the commodity sector in many developing countries.¹⁰

16. Improving access to foreign exchange - by replacing government control of the allocation of foreign exchange with market mechanisms - can be as important as removing overvaluation for imparting impetus to a diversification programme (see box 1 for some examples). For when a sizable share of foreign-exchange transactions takes place in parallel markets, the principal effect of liberalizing access to foreign exchange is to steer foreign exchange into official channels, thereby raising official foreign-exchange receipts. In particular, countries which are naturally endowed with easily transportable resources of high value, such as gold or precious stones, can expect a substantial improvement of officially recorded exports from this measure, which in turn, could encourage a shift of government expenditure towards extension services such as geographical mapping or quality control, in favour of these sectors. In addition, it could raise the incentives for private and foreign investors to become active in those sectors. By contrast, when foreign-exchange transactions have been constrained by controls and regulations, the main effect of foreign-exchange liberalization is to strengthen incentives for export production, in particular by improving access to imported production inputs. Timely availability of the latter is often important for the diversification of output and exports.

Box 1

Foreign exchange regime reforms

While foreign-exchange regimes have been relatively free for many years in countries such as Bolivia, Sri Lanka and the members of the CFA-franc zone, other countries, for example, Argentina, Bangladesh, Colombia, Ghana, Guinea, Guyana and Malawi, have recently completed, or nearly completed, unification of exchange markets and allowed full retention of export proceeds. Other countries, such as Uganda, adopted reforms to absorb the parallel market into a system of foreign-exchange bureaux, establishing the exchange rate in auctions. Some of these reforms have affected the commodity sector directly. The Kenyan Government, for example, has required all transactions on the tea auctions in Mombasa to be made in US dollars since August 1992. This has facilitated faster payments to both producers and exporters, as well as the import of production inputs, and has reduced the exposure of exporters to exchange-rate risk.

17. Other measures aimed at "getting the prices right" have been directed at creating a neutral set of incentives for imports and exports at a low and unified

¹⁰ Experience has shown that many countries which have been successful in diversifying have built their improved performance on a strong agricultural sector. An important element of Colombia's success in fostering economic growth and reducing its dependence on coffee exports was the rise in its exports of fruits and cut flowers, in addition to the country's good fortune in discovering coal and petroleum deposits. Rising exports of tropical timber contributed to the reduction in Indonesia's dependence on petroleum exports and to the strengthening of employment-creating forward and backward linkages in the economy. Other exporters of tropical timber, such as Gabon and Ghana, also experienced a boost to their economy as timber was one of the few primary commodities that has not experienced a large decline in export prices over the last few years.

level of tariffs. A recent analysis¹¹ of the relationship between such liberalization of the trade and payments system and diversification of output and export over the 1980s for 24 African least-developed countries concluded that countries with low scores on the liberalization index tended to have negative average export growth, low manufacturing growth and no export diversification. However, while this analysis suggests that faster growing and diversifying economies tend to have higher values for the liberalization index, it is difficult to determine how much of this better performance can be imputed to trade liberalization. A favourable shift in the terms of trade or a rescheduling of external debt, for example, would raise the availability of foreign exchange allowing for higher imports and, probably, reduce the premium on foreign exchange. An attempt to separate out the influence of different policy shifts such as trade liberalization therefore requires taking account of the particular circumstances of different countries.

18. Development of the financial sector allowing for a high level of financial intermediation is a crucial determinant of realizing fully the gains from stabilization, liberalization and private sector activity, because bank and non-bank institutions can encourage a more efficient allocation of new investment by favouring entrepreneurial investors and faster growth sectors. A very important commodity-specific issue in financial-sector reform is how to make commodities acceptable as collateral for bank credits. Contrary to commercial banks in developed countries, banks in many developing countries require fixed assets as collateral. This implies that access to official credit is severely constrained for those producers and exporters of commodities whose physical capital, e.g., buildings, is low.¹² Moreover, the supply of official credits is often limited to urban areas, yet local entrepreneurs often operate in rural areas and have a local bias in looking for credit. As a consequence, potentially promising diversification efforts in rural areas can be choked off by the lack of credit. Expanding the network of bank branches or creating savings associations at the farmer and/or exporter level seems therefore to be needed in many developing countries.

19. In undertaking structural adjustment to reduce fiscal deficits and government involvement in the economy through privatization and liberalization, a government may, inadvertently, make improving competitiveness and diversification more difficult. When combined with reform of commodity marketing boards and trading companies, expenditure cuts can impact negatively on the provision of such essential support services for commodity production and export as information, quality control, credit provision, marketing, and research and development.

20. Moreover, although economic reform designed to provide economic incentives is widely recognized as an indispensable element in the successful implementation of diversification programmes, only governments can establish and guarantee the reliable framework of regulations and basic infrastructure, in terms of both physical and human capital, which is an essential condition for dynamic private-sector activities. In addition, in areas where market failures prevail, the limitations of market forces are quickly reached, and policy makers have to choose between the failure of the market and the alleged inadequacy of the state to perform a number of key functions. Only when the conditions for private-sector responsiveness to economic incentives are present can the benefits of economic reform be reaped fully. The following paragraphs discuss those areas in which it appears that a government should play an active role. Whereas the

¹¹ See UNCTAD: *The Least Developed Countries 1993-1994 Report*, (New York, 1994) pp. 54-58.

¹² One way of addressing this problem would be to deposit the commodities in warehouses managed according to international standards. This requires, *inter alia*, that the warehouses be legally independent and controlled by an independent and licensed trustee or warehouse company.

case for an active role of the state is widely acknowledged in some of these areas, it is controversial in others.

B. National policies designed to improve the capability of market participants to respond to economic incentives

21. Creation of an appropriate regulatory framework, including company and bankruptcy laws and investment codes, is one of the most important forms of government intervention. Developing countries often lack such a framework, in particular when liberalization measures are taken before a reliable legal framework conducive to private sector activities has been created. The conclusions of the workshop on "Commodity export policies and strategies in African countries in a process of structural adjustment",¹³ for example, stress in this respect that the right of private individuals to acquire land and have a secure right of tenure is fundamental for farmers to have an incentive for taking good care of the land. Workshop participants also urged that licensing and registration procedures facilitate, rather than complicate, activities of the private sector, and that a code of business standards be implemented to permit sanctioning of unethical business behaviour so as to raise exporters' credibility in international markets.

22. It is generally recognized that the provision of basic infrastructure by the government is crucial for the successful development of competitiveness and diversification and that there is still broad scope for improvement in many developing countries in this area. Diversification efforts pose a particular challenge in this respect when physical infrastructure networks have been planned and built for traditional export commodities. For example, successful diversification in the export of fresh fruit and vegetables requires timely and reliable transportation of the produce to destination markets. However, when roads to international airports, cold storage facilities and air freight space are poorly developed or non-existent because such infrastructure is not needed for the export of traditional commodities, diversification efforts can be seriously constrained.

23. Experience in restructuring commodity marketing boards, which used to provide a wide array of export extension and marketing services, suggests that state entities have an important role to play in providing export extension services; this includes to provide market information and basic agricultural research, to develop and maintain quality standards, and to maintain and enhance the image and reliability of export structures, e.g., by providing appropriate and realistic legislation including an arbitration procedure for cases of dispute between clients and specific exporters. Experience also suggests that marketing itself, by contrast, appears to be best left to professionals of the private sector.¹⁴ However, steps taken to improve the financial position of commodity marketing boards have led to reduced staffing of these entities and often meant a cessation of support services. Such services could, in principle, be provided by the private sector, but the appropriate legal framework and capabilities that would give impetus to local entrepreneurs to do so are often missing. The absence of appropriate quality standards and their enforcement caused by the abolition of the coffee marketing boards in Cameroon and Madagascar, for example, led to a significant drop in quality, and hence competitiveness, of coffee

¹³ See "Commodity export policies and strategies in African countries in a process of structural adjustment: cotton, tea and horticultural products", UNCTAD/COM/47, 1994: report of a workshop organized by UNCTAD with support from Australia, Israel, ITC and UNDP and held at Dar es Salaam, United Republic of Tanzania, in November 1993.

¹⁴ Marketing issues are addressed in section C of this chapter.

exports from these countries.¹⁵

24. Problems of information or other imperfections in financial markets of developing countries suggest the presence of market failures preventing prices from transmitting the correct signals, or economic agents from responding to them. A recent study by the World Bank¹⁶ concluded that directed credit and other forms of financial intervention may have helped Japan, the Republic of Korea and Taiwan, Province of China, to develop their industrial structure. The question therefore arises whether other developing countries should follow the example of the newly industrializing countries regarding government interference in financial markets. Although empirical evidence on this issue is scarce and more research is needed, it would appear that such market failure can justify government intervention in financial markets as in East Asia only when the financial sector already is fairly well developed, so as to ensure some degree of competition, and when enterprises as well as financial institutions are subject to some kind of bankruptcy law.

25. The importance of research and development for international competitiveness and the catalytic role of the government in this area for both the industrial and agricultural sectors scarcely needs restating. In agriculture, many developing countries have succeeded in developing high-yielding varieties and improved cultivation techniques. In Bangladesh, for example, research and development has contributed to achieving foodgrain self-sufficiency by widespread use of high-yielding rice varieties, improved farming and irrigation methods, as well as more efficient application of fertilizers.¹⁷ In many developing countries in Africa, by contrast, cultivation methods differ little from those used decades ago. The apparent lack of research and development in African agriculture may be partly the result of the implicit taxation of agricultural activities caused by exchange rate misalignment and inappropriate producer-price policies. However, problems in finding financial resources also seem to have played a crucial role in this area. Not only have governments retrenched spending on research and development but also donors have not given priority to providing external finance so as to fill the gap caused by insufficient domestic funding. One solution to this problem could be to explore ways of co-financing research and development by the government and the private sector. The Farmers Horticultural Exports Association in Malawi, for example, obtained funding for this area from the ITC and UNDP mediated by the government and the Malawi Export Promotion Council.

26. Human capital formation is crucial for enhancing competitiveness, but fiscal restraint as part of economic reform has often been translated into a cut in education budgets, and precisely at a time when bilateral aid to education was not adequate to ensure maintenance of the already very low level of recurrent spending per pupil reached at the beginning of the 1980s. During the structural adjustment programmes in Senegal, for example, education spending fell from 33 per cent of GDP to 26-27 per cent, making it impossible to build new schools, or to alleviate the existing shortage of textbooks and the further worsening of teacher-pupil ratios.¹⁸ The declines in the quantity of educational spending

¹⁵ For details see O. Matringe, "Analysis of coffee exports in Burundi, Cameroon, Cote d'Ivoire, Ethiopia, Kenya, Madagascar, Rwanda, Uganda and the United Republic of Tanzania", in: UNCTAD, "Government policies affecting coffee export marketing", Volume II, UNCTAD/COM/MISC.55/ADD.1 (1993).

¹⁶ World Bank, *The East Asian Miracle* (Oxford, Oxford University Press, 1993).

¹⁷ It should be noted, however, that many commentators have recently begun to urge a second look at "green revolution" policies in the light of the environmental damage caused by the intensive application of fertilizer common to these policies.

¹⁸ See P. Noonan, "Continuing crisis in African education", in: *African Recovery*, vol. 7, No. 3/4 (1994) p. 23.

have hence directly translated into an erosion in the quality of schooling.

27. Practical learning may be as important as formal education for successful export diversification. Acquiring appropriate practice-oriented skills in packaging, marketing and other areas of pre- and post-harvest handling can contribute significantly to the improvement in quality of a country's exports, and hence to its competitiveness. However, many developing countries have invested little in skill upgrading, in part because several of the steps in skill upgrading have the characteristics of public goods, i.e., individual companies can appropriate the rewards only with difficulty. Overcoming the learning-to-learn barrier and the undertaking of contract research or other pre-commercial research activities are examples of this. In addition, the education market may fail to anticipate fully the skill needs of dynamic commodity (and other economic) sectors in time to provide an adequate base of human capital for realizing the full potential of these sectors. Further, companies may hesitate to invest in skill upgrading themselves fearing that they will not be able to retrieve the full benefits of their investment in case trained employees leave the company. These externality-caused market failures may deter socially desirable investment in human capital and warrant targeted government intervention in this area.¹⁹

28. To summarize, the above discussion suggests that creating an incentive system can be conducive to improving competitiveness and diversification only when factors bearing upon the responsiveness of economic agents to economic incentives are appropriate. An economic environment designed to facilitate diversification also must address legal, regulatory and structural impediments to the operation and expansion of the private sector. At the macroeconomic level, stable price signals and a sufficiently credible policy would seem to be important for evoking strong responses from risk-averse economic agents. Other factors include a legal framework that guarantees the predictable enforcement of contracts and property rights; the provision of basic infrastructure and supporting institutions, in particular in the areas of transportation, telecommunication and market information; development of a financial sector that allows exporters to have ready access to working capital and export finance; and a technology policy that assures human capital formation required for the assimilation of new production technologies.

C. Ways and means for a country to find market opportunities for its commodities

29. Economic reform strategies designed to improve a country's competitiveness often emphasize competitiveness in production and neglect the fact that finding market outlets and export marketing itself are crucial determinants of improving competitiveness and, in particular, export diversification. For the output of diversification efforts to be competitive on any market, there have to be persons who know and can use modern marketing techniques, have reliable sources of information and contacts, and are able to convey the needs of consumers to the production side.

30. The structure of commodity export marketing in developing countries has undergone considerable change.²⁰ For practically all commodities, there has been a significant increase in the number of both countries and persons active in commodity export marketing. In the case of base metals, the globalization

¹⁹ On this issue see also S. Lall, "Understanding technology development", in: *Development and Change*, Vol. 24 (1993) pp. 719-753.

²⁰ On this issue, see also J. Farooq and L. Rutten, "The challenge of marketing commodities from developing countries", in: B. Hartantyo, and H.P. Smit (eds.), *International Commodity Development Strategies*, (VU University Press, Amsterdam, 1993).

of activities of mining companies from developed countries and, more recently, the privatization of mining companies from developing countries are the main reasons for this development. The increased number of market participants has also contributed to both the change in price formation from a producer-price system to exchange-based reference prices and the increased use of modern marketing techniques in the metals area over the last few years. An exchange-based system of price formation leads by its very nature to higher short-term price volatility, compared to producer prices, and therefore demands better skilled personnel, ready and reliable access to information and more investment in maintaining a good and stable relationship with clients in order to be competitive in marketing. However, given that many mining as well as oil companies rely on large-scale production units, they can afford to maintain their own marketing department, with well-trained staff and direct access to world-wide information and communication networks, undertaking market studies, investing in the penetration of new markets, and having their own agents overseas.²¹

31. In the agricultural sector, the increase in the number of market participants has been mainly due to the liberalization of export marketing, as part of which centralized export agencies such as commodity marketing boards have been abolished in many developing countries. The relatively small size of the new market participants and their inexperience in international commodity marketing and marketing techniques has often hampered the maintenance of market shares for traditional export commodities, as well as the successful development of non-traditional exports. As a reaction to the atomization of export marketing of traditional commodities, for example in African cocoa-exporting countries, trade houses such as ED&F Man or Cargill have established their own network of buyers who purchase the commodity directly from the producer. However, the increase in new market participants consequent upon the demise of commodity marketing boards has meant that international trade houses do not know who would be a reliable trade partner. In such a situation, the natural response of the trade houses is to charge a risk premium to producers, with the result that farmers receive lower prices than otherwise. This marketing system is probably also less beneficial for exporting countries than possible alternatives, e.g. associations of exporters, as the producers and small local traders have very limited negotiating power. This is caused by their limited knowledge of modern commodity marketing techniques and by the fact that they have to cope with a generally poor domestic economic environment. They therefore compete on an unequal footing with representatives of the foreign trade houses who have access to all of the information, communication facilities, marketing expertise and financial resources of their parent company. In addition, this marketing system has proved to be costly for the trade houses because they need representatives in the country and may want to hold stocks larger than commercially and financially optimal because of their limited trust in the reliability of the small producers.

32. Cooperatives and associations of producers - grouping together several small and medium-sized producers for the provision of services such as transportation, information and marketing - have been a powerful instrument in several developing countries to raise the bargaining power of individual producers and create the image of being a reliable counterpart in trade. Experience of such cooperatives and associations shows that successful competition with agents from foreign trade houses depends very much on their size, financial situation and previous marketing experience. Those who have been successful usually had sufficient marketing experience to enable them to meet contractual obligations in terms of both timely delivery and quality. They also had a sufficiently solid financial position to be able to invest in advertising campaigns, product differentiation, own information services, overseas

²¹ For example, all of the large oil-producing companies of Mexico, Saudi Arabia and Nigeria, as well as the main copper mining companies of Chile and Zambia, have offices in London.

representatives, training programmes, etc. Others, by contrast, have often suffered from inexperience in international marketing as well as from a lack of working capital and access to credit. This prevented them from giving prompt payment or offering pre-harvest credits.

33. Knowing how to make adequate use of modern marketing instruments has become indispensable for being a competitive participant in many international commodity markets. Commodity buyers and sellers increasingly use exchange-generated prices as reference prices for their physical trade, apart from using futures and options contracts for hedging. However, few commodity exporters from developing countries have actually made use of these instruments either directly, through hedging, or indirectly, using exchange-determined prices as reference prices in executable orders (often used in sugar trade) or price-to-be-fixed contracts (often used in coffee trade). One important reason for this has been that government policy makers often have a lack of understanding of, and information on, the functioning of commodity exchanges and risk management instruments, with the result that their policies have, in many cases inadvertently, hindered or prevented the use of such methods by private exporters. UNCTAD and the World Bank have addressed this problem in their technical assistance and training programmes, as well as issues concerning the strategic and company control structure aspects of risk management.²²

34. However, not all problems developing countries and economies in transition have in using risk management instruments can be overcome by training efforts. Companies from developing countries and economies in transition are often not accepted as clients by intermediaries, such as international banks, which provide access to international risk management markets. Such intermediaries often consider the counterpart and sovereign risks involved in transactions with these companies too high. Counterpart risk, or the risk of company-specific defaults, can be the result of the debtor's bankruptcy or his misunderstanding of the objective of risk management instruments with the consequence that the company reneges on its contractual obligations. Sovereign risk refers to the possibility that a state-owned company defaults, or that a domestic private or a foreign company defaults because of a change in legislation by the government, e.g., its declaring the contract illegal or blocking the foreign exchange needed to fulfil the contract obligations.

35. Experience shows that several possibilities to overcome such access problems exist.²³ The prime consideration appears to be that the track record of a company in terms of meeting contractual obligations as well as its commercial strength, reputation and credit rating must be faultless. However, the risk assigned to a company by a risk-management intermediary can never be lower than the sovereign risk of the country in which the company is located because, in the final instance, any company must comply with government legislation in fulfilling contractual obligations. Accordingly, an important factor in meeting access problems is the existence of a legal framework which is both reliable and conducive to the use of risk management instruments. Second, a company can build a reputation of being a reliable counterpart by entering into transactions which at the beginning involve relatively little risk for the intermediary, and later entering into increasingly more complicated transactions with this same intermediary. Third, national foreign-currency regulations can be adjusted in such a way as to allow for offshore accounts of domestic companies; this lowers the risk that a company defaults because of its

²² These issues are documented in UNCTAD, "Contribution to the improvement of the functioning of commodity markets. Analysis of ways of improving the efficiency and use of existing mechanisms for the management of risks arising from commodity price fluctuations", TD/B/CN.1/10, 27 August 1993, and were discussed by the Standing Committee on Commodities at its second session.

²³ For a more detailed discussion of this issue see UNCTAD, *Counterpart and sovereign risk obstacles to improved access to risk management markets; issues involved, problems and possible solutions*, TD/B/CN.1/GE.1/3, July 1994.

inability to obtain the foreign exchange needed for the transaction. A fourth possibility is engaging in countertrade and barter arrangements, or pledging physical inventory as collateral. Finally, the intermediary of risk management instruments can contract for sovereign risk insurance to insure itself against non-delivery by a private company or a government agency and against confiscation and nationalization. However, in order to overcome counterpart and sovereign risk barriers to the enhanced use of risk management instruments, changes, often of a far-reaching nature, in legislation and economic policy in particular regarding access to foreign exchange may be required in many developing countries and economies in transition.

36. Having access to adequate trade-related information and the capacity to analyse this information in a way conducive to entering international trade is also an important factor in successfully developing trade opportunities for exported commodities. One way in which this can be done is via the "Trade Point" concept, initiated by UNCTAD "to open international trade to new participants - especially small- and medium-sized enterprises - by simplifying and harmonizing trade procedures worldwide and giving traders access to advanced technologies and information networks".²⁴ Trade Points have so far been created in 60 countries²⁵ with a view to establishing one-stop information centres in order to lower transaction costs of importing and exporting operations. Experience of many successful exporters of commodities suggests that regular and personal contacts have been of considerable help in establishing a relation of mutual trust with their clients as well as in obtaining sure market outlets. Such contacts may be initiated through activities of a Trade Point, in addition to family ties or contacts established through schooling abroad.

37. Using the services of an association for the promotion of exports of or imports from developing countries is a further way for developing countries to find market opportunities for their commodities. The UNCTAD/GATT International Trade Centre (ITC) advises governments of developing countries on their national trade promotion strategies, institutions and services. In particular, it provides information on new export opportunities and advises countries on how to adapt products for exports and to promote these goods on the international market. In addition, the ITC has made available trade manuals on physical trade for several commodities, such as cocoa, coffee, copper, horticultural products, sugar and vegetable oils and oilseeds. UNCTAD's TRAINFORTRADE programme has developed computerized courses on physical trade in cocoa, coffee and sugar, partly on the basis of these ITC manuals, and has also created courses on risk management for cocoa, coffee, cotton, palm oil and sugar. Other institutions also promote commodity trade. The COLEACP,²⁶ for example, promotes horticultural exports from ACP countries to countries of the European Union through the provision of marketing and general trade information services, technical and commercial training courses, technical assistance missions, trade and product promotion and the organization of an annual ACP/EU trade conference. Other bodies, such as the Dutch CBI (Centre for the Promotion of Imports from Developing Countries) for the market of the European Union and in particular the Netherlands, provide market information, intermediary services (e.g., databases on potential importers, organization of marketing missions or trade fairs) as

²⁴ UNCTAD, "The Trade Point: concept and implementation", TD/B/WG.2/7/Add.1, 7 October 1993.

²⁵ For a list of countries in which Trade Points have been established, see UNCTAD, "Final report of the Ad Hoc Working Group on Trade Efficiency", TD/B/40(2)/L.6, 17 May 1994, annex II.

²⁶ The COLEACP is the Committee for Liaison between Europe and the African, Caribbean and Pacific countries signatory to the Lomé Conventions for the promotion of tropical and off-season horticultural exports. It was created in 1973 with the support of the Commission of the European Communities as an international, non-profit-making, private association.

well as training programmes, usually free of charge.²⁷

38. Many developing countries have established national export promotion agencies, often under the administrative control of a ministry.²⁸ Experience with these agencies suggests that in order to be efficient they need to have the support of the local business community, be adequately funded, have an adequately qualified and paid staff, and have some independence from government. Export promotion agencies often lack support from the business community because they are too closely linked to the government and because they provide few follow-up services once the initial contact with trade partners is made via fairs or sales missions. This lack has proved to be a major obstacle for inexperienced exporters in trying to establish lasting trade relationships.

39. Despite this negative experience with national export promotion agencies, there is still a case for the establishment of agencies designed to provide market information and facilitate communication and cooperation between the private and public sectors, for diversification and taking advantage of market opportunities. A functional partnership between the government and the private sector has often been the key to successful export activities in developing countries in and outside East Asia (see box 2). The establishment of national diversification councils in African countries has been discussed in connection with the United Nations New Agenda for the Development of Africa in the 1990s. National diversification councils would address the presently existing gap in development assistance concerning the pre-investment phase activities (identification, preparation and appraisal) of diversification programmes. They would be designed to generate a stream of project proposals that fit into national diversification programmes and priorities, as well as be a focal point at the country level for the private sector and the government to work together to assess diversification opportunities in the light of local resource endowment, human capital, infrastructure and technology. Such a council would, by contrast, not have the power to decide on or execute specific pre-investment activities.

40. Exploiting environmental advantages offers considerable potential market opportunities for developing countries. Such opportunities can be expected to grow with increased environmental consciousness on the part of consumers, suitable legislative frameworks in importing countries and convincing evidence of the environmental advantages of exported commodities. In many instances, one of the crucial issues in this area is persuading consumers to pay a higher price for a commodity produced on an environment-friendly basis compared to the price for an established product. Among the best known examples in this area is coffee sold in several European countries under the brand name "Max Havelaar", or the cooperation between importers of cotton textiles and Turkish exporters. Other crucial issues are to improve the technical characteristics of some commodities and to adapt industrial technologies to facilitate substitution by environment-friendly products; examples of this include improving the quality of natural fibres for increased industrial use and changing some aspects of automobile engines to allow for the use of sugar-based fuel.²⁹

²⁷ For an annotated list of import promotion agencies, see UNCTAD, "The improvement of information flows to aid investment decisions", TD/B/C.1/AC/11, 23 August 1990, p. 22.

²⁸ Parts of this paragraph draw on D. Keesing and A. Singer, "Why official export promotion fails", in: *Finance and Development*, vol. 29 (1) (1992) pp. 52-53.

²⁹ For a more detailed discussion of this issue see UNCTAD, "Identification of means by which the competitiveness of natural products with environmental advantages could be improved", TD/B/CN.1/25 (1994).

Box 2

Deliberation councils and other functional partnerships

Successful diversification and export promotion have frequently been spurred by institutional partnerships linking the government and the private sector. Examples are provided by the role deliberation councils have played in Japan, the Republic of Korea, Malaysia and Singapore. Within these councils "private sector groups are invited to help shape and implement the government policies relevant to their interests. In contrast to lobbying where rules are murky and groups seek secret advantages over one another, the deliberation councils are intended to make allocation rules clear to all participants." (see *"The East Asian Miracle"*, op. cit., p.14.) It can be said that from "an economic standpoint, ... [deliberation] councils facilitate information transmission. They enable the bureaucracy to gather information about world markets, technology trends, and the impact of regulations domestically and abroad, synthesize the information into an action plan, and communicate the plan back to the private sector. Self-interested behavior is more or less constrained by the repeated nature of the collaboration. This in part helps establish credibility - private sector participants believe cheating and renegeing are less likely." (Ibid, p. 187.) These councils also serve as a medium of exchange of points of views regarding changing conditions in world trade, finance and marketing conditions; developments within the domestic economy; the channels through which policy instruments affect economic conditions; opportunities created by technological progress; and about the interaction between government measures and other policy variables.

Other examples include the Kenyan tea and horticultural sectors, where the government has provided valuable supervisory and regulatory support, in particular in the areas of quality control and research and development, while not interfering in export marketing. The privately managed Fresh Produce Exporters Association of Kenya has collaborated closely with the government on all issues concerning the horticultural sector and taken over several functions of the state-owned Horticultural Crops Development Authority, including the provision of extension services, training, market information and other services to its members. In general, the roles of the private sector and the government have been well defined with the private sector controlling production and marketing and the government providing institutional support. In the Israeli cotton sector, research and development projects and quality control are financed jointly by the government and cotton growers, while export marketing is done through the Cotton Production and Marketing Board which was created and is owned by the growers. Another form of government support to private-sector activities that has been employed by developing countries regards the adjustment of investment codes so as to attract producers and exporters who were successful in other countries in the respective commodity sector. In the United Republic of Tanzania, for example, the bulk of exporters in the horticultural sector are those who had previous experience in Europe (Dutch investors exporting flowers) or Kenya (Kenyans or Tanzanians with family ties to Kenya exporting fruit and vegetables). Chile succeeded in boosting its exports of fruit by taking advantage of the marketing knowledge and long-established trade links of a transnational corporation.

41. Commodity exporters from developing countries often face trade barriers of various kinds which can impair their ability to penetrate new markets. Several countries have, however, been able to counter such barriers. Flower producers in the United States, for example, filed anti-dumping and compensatory rights suits against Colombian flower exporters to obtain an additional tax on Colombian flowers. The legal costs for Colombian exporters involved in such lawsuits were paid by the Government. This Government support succeeded in limiting the adverse effects on the competitiveness of Colombian flower exporters: adequate defence avoided an anti-dumping margin for a long time; moreover, lobbying activities succeeded in halving the level of the margin once it was put in place. Trade barriers have also been established by importing countries on the grounds that the exporting country pursues environmental or health policies different

from its own. The United States' Marine Mammal Protection Act 1972, for example, prohibits imports of any commercial fish or fish products harvested by a method that results in the incidental killing of or serious injury to marine mammals in excess of United States standards. This is the case, for example, for yellowfin tuna harvested with purse seine nets in the eastern tropical Pacific, a method which has resulted in the incidental killing and injuring of many dolphins. A recent GATT dispute settlement panel, with the EEC and the Netherlands as co-complainants against the United States, however, found that it was not justified to impose a trade embargo in pursuit of environmental objectives in order to secure changes in policies which other countries pursued within their own jurisdiction.³⁰

42. To summarize, evidence from developing countries which have made substantial progress in terms of export diversification and taking advantage of market opportunities suggests that a focus on competitiveness in the sense of "getting the prices right" is too narrow. To the extent that measures designed to build competitiveness are associated with reduced public and private investment and reduced basic extension services, those measures can actually be counterproductive. Good knowledge of marketing practices has become imperative for a country to find market opportunities for its commodities as well as to ensure that identified export markets can be penetrated and maintained, and only those with the means to invest in manpower and information systems are likely to be able to build up such knowledge. Developing a functional partnership and division of responsibility between the government and the private sector seems to be crucial for both economic development and export diversification. In such a partnership, governments may find it necessary to restrict their role to that of providing an enabling environment, while the actual implementation of production and marketing activities could be in the hands of the private sector.

Chapter III

INTERNATIONAL POLICIES AFFECTING MARKET OPPORTUNITIES FOR COMMODITIES AND OPPORTUNITIES FOR DIVERSIFICATION

A. Ways and means of increasing the market opportunities for commodities in the medium term

1. Market access

43. It is almost self-evident that market opportunities for exported commodities will improve when market access barriers are lowered. The outcome of the Uruguay Round in this regard is to be analysed in the newly established Ad Hoc Working Group on Trading Opportunities in the New International Trading Context. However, the benefits of barrier reductions are almost always quickly appropriated by those with existing production capacities as they are in a position to respond to new opportunities. The question then arises as to whether the Uruguay Round progress on barrier reduction will bring much real benefit to highly commodity-dependent developing countries which are in need of diversification. Therefore, how best to help these countries take advantage of market access liberalization is not clear and requires further analysis.

³⁰ For details, see GATT, "United States - Restrictions on imports of tuna. Report of the Panel", DS29/R, 16 June 1994.

2. Improving information on demand and market requirements

44. For commodities, as for any good, it is primarily the consumer who dictates the quantity and quality of the item being bought. It is thus a necessary condition for a successful producer or exporter of commodities to know how to find and take advantage of information on market requirements, and he can be assisted in this effort by various national actions as outlined in chapter II. The international community has addressed the issue of improving information flows on commodities frequently. Several international agencies such as FAO, UNCTAD,¹¹ ITC and the World Bank collect and provide commodity-related information in various formats and at varying time intervals. While these actions help in providing data on supply, demand, prices, and trends, nevertheless the main source of up-to-date information relevant for marketing commodities remains, and will likely remain, the private business community.

45. The international community can help to stimulate demand for commodities by facilitating access by producers and exporters to relevant usable information. The ways of so doing include training on how to find, use and assess information and information sources, such as is provided by ITC in many of its country projects; assistance in the setting-up of exporter/importer groups such as COLEACP; and using import facilitation agencies as conduits for information. Useful also is the provision of funds for collecting and disseminating data on products where the commercially provided information is scarce and/or very expensive.¹² Rational resource allocation requires, of course, that users pay for the information they need for their commercial business; however, equity considerations suggest alleviation of the cost burden for developing country producers and exporters, for example, through cost-sharing among users or with donors.

3. Generic promotion of commodities

46. Generic promotion appears to succeed when demand is growing relatively well. Successful campaigns have included the promotion of wool through the woolmark, similar labelling for cotton and rubber, and health-related campaigns for certain foods such as unsaturated vegetable oils. When markets are close to saturation, however, generic campaigns flounder on competition among producers, and product differentiation for the same commodity becomes important. This happened, for example, with tea promotion through the International Tea Association in the mid-1980s.

47. Recent efforts at generic promotion have attempted either to promote demand for traditional commodities in specific markets which have low consumption per capita as compared to other markets¹³ or to promote traditional commodities which appear to have environmental advantages in traditional markets.¹⁴ The

¹¹ This issue was discussed in detail by the Working Party on Diversification, Processing, Marketing and Distribution of the Committee on Commodities in November 1990 on the basis of the secretariat report TD/B/C.1/AC/11 entitled "Information flows to aid investment decisions".

¹² The Market News Service of ITC is particularly noteworthy for its efforts to provide frequent information on specific commodities for which public sources are rare.

¹³ This is, for example, the rationale behind the project to promote cocoa consumption in Japan being financed jointly by the Second Account of the Common Fund and the Chocolate and Cocoa Association of Japan.

¹⁴ Examples include sisal and jute market promotion projects by the ITC and programmes in some countries to promote organic coffee or other foods grown under environment-friendly conditions.

latter type of campaign attempts to create new demand or niche markets, whilst the former type attempts to change consumer preferences. Generic promotion could be envisaged as an integral part of efforts to find new end-uses for commodities, in order to make consumers aware of the existence and qualities of the new products developed. In this regard, a generic promotion component could be built into any multi-country project concerned with new end-uses, such as those sponsored by the Second Account of the Common Fund.

48. Demand for commodities exported by developing countries can be positively affected by the support provided by import promotion agencies of various developed countries. These promotion agencies are not geared only to commodity exports and naturally respond to demand for information on product groups of interest to their clients, both importers and exporters. As a result it is usually the more organized and enterprising developing countries which take advantage of their facilities.

4. Promotion of new end-uses of commodities

49. Experience suggests that the most effective way of improving the demand for a commodity is to find new uses for it. Examples of this abound, ranging from the use of sugar as a fuel and as a fertilizer to the use of cocoa in cosmetics and to the development of materials made from new blends of metals or of furniture from rubber trees. The development of new end-uses is a research-intensive activity, funding of which is usually done by specific entities in the private sector, which then draw commercial advantage from the results, using patents, licences and other devices. Some research is, however, undertaken in the public domain with the results available to all producers; for example, this is how the "green revolution" spread and new varieties of rice were developed. In certain cases, commodity-specific research institutes exist under the aegis of several governments, such as those for rubber and tea; or university departments are funded, as for palm oil in Malaysia. The international community has traditionally supported research activity but funds have become relatively scarce with reductions in aid budgets.

50. Research on new end-uses has to be supplemented by trial production and model factories, followed by trial sales and use by consumers. This is an area where the Second Account of the Common Fund is making a modest contribution through projects on use of sugar and cocoa by-products, rubberized coir and coir geo-textiles, rubber packaging materials and zinc die casting.¹⁵ While the results of these projects will be available to other producers, there is also a need to promote the new products with consumers. It would therefore seem most logical for all new end-use projects to include a promotion element to be activated once the production of the new product is shown to be feasible. Moreover, it should be borne in mind that although some new uses may satisfy unmet consumer needs and so increase aggregate demand, others may be competing with the use of alternative commodities and hence contribute to a reorientation of demand rather than its increase.¹⁶

¹⁵ See Common Fund for Commodities, *Annual Report of the Managing Director on the Activities of the Fund*, (Amsterdam, 1993).

¹⁶ This is, for example, what occurred with the use of vegetable oils rather than cocoa butter in chocolate, and with the use of aluminium rather than heavier metals in transport vehicles.

B. Support for diversification

51. The implementation of diversification activities is primarily a national responsibility, with the national policy framework within which these activities take place being of crucial importance, as discussed in chapter II. However, there are certain policies at the international level, including policies on market access which have a decisive influence. The international community has also committed itself to providing support to national diversification programmes, particularly for countries which remain excessively dependent on a limited number of commodities for their export earnings. This support can be classified into four types: support relating to policy issues, including support for exchanges of experience on national policies and actions; the provision of information relevant to pre-investment activities; technical assistance for training, for assessing feasibility, for making technology choices and for market penetration; and the provision of funds for investment activities per se.

52. Exchange of experience is very useful for developing country governments in deciding on elements of national policy which are most conducive to their objectives, including diversification. The international community has promoted such exchanges via intergovernmental meetings including the General Assembly³⁷ and UNCTAD,³⁸ but these discussions have had a tendency to remain at a fairly general level without much direct interest to the governments of the concerned countries.

53. It appears therefore that the most practical way of using material on issue-based and country case studies would appear to be exchange-of-experience seminars at the subregional level, involving two or three commodities and a limited number of countries, with resource persons from countries which had successful diversification experience in one or more of the selected commodities, and participants from both government and the commodity sectors themselves. Such seminars allow for both a very concrete exchange of actual policies tried and their results, and also a face-to-face discussion between government policy makers and representatives of their commodity sectors. This type of seminar was conducted last year in East Africa;³⁹ the ECA is planning a similar seminar in Cameroon in the second half of 1994. Organization of such workshops would be one of the functions of the proposed diversification fund for Africa's commodities in its work with national diversification councils.

54. Information relevant to pre-investment activities includes both information on possible external markets and a clear assessment of national opportunities.⁴⁰ One problem in this area is whether the interested persons at a national level are aware of the sources of information and can assess their credibility;

³⁷ See, for example, the discussion under the review of UNPAERD (United Nations Programme of Action for African Economic Recovery and Development) in the report, "Implementation of diversification in the commodity sector in Africa at the national, subregional and regional levels with the support of the international community", A/46/324/Add.1 (1991) and subsequent discussions.

³⁸ See the discussions of the Working Party on Diversification, Processing, Marketing and Distribution of the Committee on Commodities, 1987-1990 and the discussions of the second session of the Standing Committee on Commodities, February 1994.

³⁹ For a report on this seminar, see "Commodity export policies and strategies in African countries in a process of structural adjustment: cotton, tea and horticultural products", *op. cit.*

⁴⁰ Information relevant to such assessment includes up-to-date geophysical surveys, soil characteristics, and other national information on seasonality or regularity of production, labour force skills of various types, and existing plants for processing and their experience.

assistance in assuring the flow of information to countries is therefore crucial. Assistance is also required in structuring information and assessments into a coherent whole, so that potential investors have a clear picture and good prefeasibility studies can be developed. This is the area of action proposed for the African diversification fund,⁴¹ as it is in Africa that information for pre-investment activities is the weakest. Although the General Assembly, in adopting resolution 48/214 in December 1993, called for intensive consultations on the issue of diversification of African economies, specifically the establishment of a diversification fund for Africa's commodities, at the time of writing (June 1994) consultations held had been inconclusive; further consultations are scheduled for September and results should be known by the time of the Standing Committee meeting.

55. A related issue in this area is concern about creating oversupply by promoting diversification into the same products in several countries at once. While decisions on the viability of specific projects are the responsibility of the investors involved, information on investment plans of others in the same commodity would appear to be a vital element in their decision-making process. The international community can help in this process by undertaking regular periodic reviews on production, consumption and investment plans in commodity-specific bodies, such as is done for iron ore and is foreseen in the International Cocoa Agreement, 1993, and then make information on their conclusions widely available. Also, financing institutions such as the World Bank Group, the Centre for Development of Industry of the Lome Convention or the Commonwealth Development Corporation can alert potential investors to possible overlaps.

56. Much technical cooperation is available, but one of the problems facing potential beneficiaries is that of not knowing whom to approach for what. Also, the conditions attached to the provision of assistance are sometimes rather onerous or tied to the use of specific inputs. Donors are often unsure of how to evaluate the relative usefulness of various forms and types of assistance, as witnessed by the repeated evaluations and changes in focus and priorities by financing agencies. It would appear that the international community could do more to coordinate the demands and offers of assistance in the commodity area, at the country level, among organizations providing assistance and through better focused reviews.

57. A review of the area of investment finance for diversification projects undertaken in UNCTAD in 1990 showed not only that the amount of international finance actually made available for this area was small but also that this finance tended to be concentrated on the countries which were already rather diversified.⁴² This conclusion is still valid today, as these countries have a good track record, know how to present good project profiles and are thus comparatively attractive to potential investors. There have been efforts by international financing agencies, often in cooperation with potential foreign private investors and international banks, to find ways of structuring financial arrangements to increase the feasibility of investments in the commodity area in developing countries. However those that have been able to profit from such arrangements to date are a limited number of mineral or fuel producers and the possibilities for expanding the number and types of structured arrangements do not seem very large for the near future.⁴³

⁴¹ See United Nations "Need for and feasibility of the establishment of a diversification fund for Africa's commodities", A/48/335 (New York, 1993).

⁴² See "Adequate financial resources for diversification: financial resources for diversification projects and programmes", TD/B/C.1/AC/12 (1990).

⁴³ For a discussion of the issues involved in structuring investment loans in the commodities area, see "Counterpart and sovereign risk obstacles to improved access to risk management markets; issues involved, problems and possible solutions" TD/B/CN.1/GE.1/3 (1994).

58. Much of the finance for smaller commodity diversification projects continues to be provided by local entrepreneurs. However, commodity producers and traders have not been able to access domestic capital very easily in many countries. Existing assistance in helping these entrepreneurs get access to overseas capital or find foreign partners thus needs to be accompanied by assistance for improvements in their local banking sector.

C. Conclusions

59. Support for diversification from the international community will for the coming decade be of crucial importance to low-income, highly commodity-dependent developing countries. National policies alone are unlikely to be able to cope with the entire weight of dependency on increasingly competitive international commodity markets. A coordinated and sufficient response particularly focused on these countries in relation to the issues identified above would certainly contribute to helping them develop a viable response to this situation.

60. The analysis in this report indicates that there is a need:

1. to make improvements in the supply of information for assessing market opportunities and for pre-investment activities and, particularly, in information analysis and assessment;
2. to increase and facilitate access to investment finance, both local and foreign;
3. to increase competitiveness through improving knowledge of marketing systems and practices; and
4. to develop concerted technical cooperation activities in the commodities area which are more sharply focused on countries excessively dependent on a limited number of commodities.

Concretely, the Standing Committee on Commodities could encourage progress in these directions, particularly by initiating or recommending actions through its members' technical cooperation programmes. It could also encourage a more direct and useful exchange of experience on related national policy questions through sponsoring a series of regional or subregional workshops.



**United Nations Conference
on Trade and Development**

Distr.
GENERAL

TD/B/CN.1/25
26 August 1994

Original: ENGLISH

TRADE AND DEVELOPMENT BOARD
Standing Committee on Commodities
Third session
Geneva, 31 October 1994
Item 4 of the provisional agenda

IDENTIFICATION OF MEANS BY WHICH THE COMPETITIVENESS OF NATURAL PRODUCTS
WITH ENVIRONMENTAL ADVANTAGES COULD BE IMPROVED

Reducing the environmental stress of consumption without
affecting consumer satisfaction

Report by the UNCTAD secretariat

CONTENTS

<u>Chapter</u>	<u>Paragraphs</u>
I. Introduction	1 - 4
II. Environmental advantages and consumer interest	5 - 17
A. Environmental advantages at different stages	7 - 12
of the life cycle	
B. Consumer interest in environmental advantages	13 - 17
III. Products with environmental advantages	18 - 22
A. Products with relatively large and	23 - 36
established markets	
1. Reusable and recycled materials/products	23 - 33
2. Biomass fuels	34 - 47
3. Organically grown products	48 - 56
B. Products with considerable potential but	57
rudimentary markets	
1. Agricultural fibres as raw materials	57 - 69
2. Alternative wood sources and wood substitutes ...	70 - 76
C. Niche products	77 - 90
1. Non-wood forest products	77 - 84
2. Natural inputs for agriculture	85 - 87
3. Products made from agricultural waste	88 - 90
IV. Conclusions and policy orientations	91 -127
A. Conclusions	91 - 98
B. Policy orientations	99 -127

I. INTRODUCTION

1. A multitude of environmental effects occur and modify the earth's ecology when a product is produced, transported, consumed and disposed of. Given that production and transportation are undertaken to permit consumption and that disposal results from consumption, the effects of these activities on the environment can be linked directly or indirectly to consumption.
2. It is generally accepted that owing to these effects, the earth's carrying capacity will be inadequate to support the continuation of the rapid consumption growth experienced over the last century, especially in the developed countries, particularly if consumption patterns with the same environmental impact are maintained. Ways and means to reduce unsustainability of consumption therefore need to be explored. Two approaches can be identified in this respect. The first revolves around reducing consumption in the developed countries, whilst concomitantly avoiding replication in developing countries of the consumption patterns of the developed ones. The second approach seeks to reduce the environmental impact of consumption by identifying environmentally preferable¹ products with less harmful environmental impacts during their life cycles, improving the awareness of consumers and industries about the existence of such alternatives, improving the competitiveness of these products, and shifting demand towards them. The two approaches are not mutually exclusive. Whilst there is much room for reducing consumption, particularly of certain items such as energy or packaging, and especially in the industrialized countries, this study, focuses on the second approach, with particular emphasis on improving the competitiveness of environmentally preferable products.
3. If prices of goods and services reflected their full environmental costs and benefits, environmentally preferable products would have a price advantage over alternatives, unlike the current situation where a large proportion of such costs and benefits is externalized. Although full cost pricing can be approached through appropriate policies and measures that promote the internalization of environmental externalities, this is unlikely to be attained in the near future. Non-price methods to improve the competitiveness of products with environmental advantages will therefore need to be utilized for some time to come. A first step in this direction is to bring to the attention of consumers and industry the existence of environmentally preferable alternatives and to stimulate their interest in using them. Although this would naturally not be a solution to all, or even the main, environmental problems, it would appear to be a cost-effective first step, benefiting from the 'mega trend' of increasing environmental consciousness, with potentially significant impacts on reducing environmental stress.
4. With this understanding, the present study aims at providing initial information on natural products with claims to environmental advantages and to establish a basis for action to increase their competitiveness. It focuses on products with supply potential from developing countries. Increased utilization of these products could help in both reducing environmental stress without impairing consumer satisfaction, and increasing the foreign exchange earnings of developing countries, thus contributing to their development efforts.

II. ENVIRONMENTAL ADVANTAGES AND CONSUMER INTEREST

5. Undisputed scientific proof of environmental advantages is very difficult, if not impossible, to obtain. In spite of the advances achieved in life cycle analysis, ranking of products according to their environmental impacts is always controversial. Given the rather modest purpose of this study, natural products with environmental advantages are defined as those which cause less environmental stress at some stage of their lifecycle than do other products that serve the same purpose. They may have been produced in an ecologically preferable production process and/or they may have an ecologically preferable end to their useful life. Products which do not have harmful effects on human health (because they do not contain harmful residues and other harmful items) are also included in this definition.

6. There would, however, be many occasions where an environmental advantage on one account (e.g. biodegradability or the use of recycled inputs) may be associated with an environmental disadvantage on another (e.g. pollution at the production stage). Whether the product can be considered to have environmental advantages on balance depends on the importance attached to different criteria. When specific products with claims to environmental advantages are referred to later in the study, the emphasis is put on the positive side but, where they are significant, environmental disadvantages are also mentioned. Claims to reducing environmental stress can be made for many products originating from developing countries. These products merit particular attention because their increased use and trade would contribute not only to environmental protection but also to development and poverty alleviation which, themselves, are seen by many as the prerequisites for preventing environmental degradation in developing countries. In this broad perspective, therefore, it would seem reasonable that products supplied by developing countries should be considered to be environmentally preferable even when they have environmental effects equivalent to those originating in richer countries.

A. Environmental advantages at different stages of the life cycle

7. Environmental advantages can be associated with the upstream or downstream stages of a product's life cycle.² The geographic scope of the environmental advantages will also influence attitudes towards environmentally preferable products.

8. Lower environmental stress at the upstream stage of a product's life cycle can occur in terms of input use and the adoption of environmentally preferable technologies. Thus, organically grown products reduce water and air pollution caused by external inputs to agriculture. Similarly, products made of otherwise polluting agricultural wastes reduce methane emissions owing to rotting or carbon emissions caused by burning of the wastes. Also, products which use recycled materials as inputs diminish the need for landfill space and the potential pollution caused by discarded materials.

9. Other natural products which reduce upstream environmental stress are those which (i) use renewable instead of non-renewable inputs, provided that the regenerative capacity of the renewable resource is maintained³; (ii) use inputs produced under more sustainable conditions than those used by alternatives; or

(iii) foster the sustainable management of exhaustible resources, including biodiversity.

10. Lower environmental stress at the downstream stages of the product's life cycle, i.e. when goods are used, consumed or disposed of after utilization⁴, stems from the physical or chemical properties of a product. This includes reduced health and safety risks when the product does not contain toxic residues of external inputs (e.g. as a result of biological pest control in agriculture) that could directly affect health or accumulate in animal and human food chains when the product is consumed; and non-environment-friendly disposal, retrieval and recycling possibilities, as when the product does not contaminate air, water or soil when it is disposed of or incinerated, or is biodegradable or easily recyclable or reusable.

11. Geographically, the reduction of environmental stress achieved by the production and utilization of environmentally preferable products can either occur exclusively in a specific locality within national boundaries and jurisdictions or span a larger region.

12. Advantages which are not bound to one country's territory include pollution reduction, with positive environmental effects on air, water or land in an adjacent country or in a shared geographical region, and the improvement of conditions with regard to transboundary living resources (e.g. migratory species). The effects can sometimes reach the whole global commons, as in the case of reductions in the greenhouse effect achieved by making use of agricultural waste, or by using agro-based fuels instead of fossil fuels.

B. Consumer interest in environmental advantages

13. Among the environmentally preferable characteristics of products mentioned above, those that occur at the downstream stages of the life cycle will be of immediate concern to consumers, whether the products are produced in their country or not. It can be expected that advantages at the upstream stages will also be of particular interest to them when the product is produced in their country. Especially in industrialized countries with a high level of environmental education and wealth, the concerns are likely to extend to the overall advantages of domestic or imported products, regardless of the stage of the life cycle at which these advantages occur.

14. Opinion polls and surveys indicate that consumer interest in environmental impacts of products is growing. For example, in Germany between 1981 and 1991, the proportion of consumers who would buy an environmental-friendly product rather than another rose from 57 per cent to 72 per cent.⁵ In the United Kingdom in the summer of 1989, it was "found that 53 per cent of those questioned had declined to buy a product during the previous year because they were worried about the effects the product or its packaging might have on the environment." A significant proportion of these environmentally conscious consumers are also willing to pay more for the products that they choose. In a study of United States consumers "in November 1990, it was found that 90 per cent of those interviewed said they would pay more for environmentally sound products".⁶ In a separate survey "consumers throughout the United States [said] they would be

willing to pay, on average, 6.6 per cent more for products that they think are environmentally friendly".⁷ According to a survey in Germany, a small majority of consumers would not refuse to spend more for an environment-friendly product, and up to 16 per cent would accept to spend more than 5 per cent.⁸

15. The interest of the consumer in environmental issues is necessary, but not sufficient, to reduce the environmental stress of consumption. Although the consuming public can exert a pressure on, and regulations can force, the business sector to be environmentally conscious, this would not be sufficient if there was no independent corporate will to take better care of the environment. Recently, a growing interest has been manifested by the business community in being "clean and green". A survey undertaken by the UNCTAD Programme on Transnational Corporations "confirms that transnational corporations have started seriously to consider their role in sustainable development and to integrate environmental concerns in decision-making".

16. To the extent that consumers and producers manifest a concern for the local environmental impacts associated with the production of imported products, certain problems of national sovereignty may be raised. Principle 2 of the Rio Declaration proclaims that "States have ... the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies". The same Principle adds, however, that States also have "the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or areas beyond the limits of national jurisdiction".

17. In the case of tradable products with local environmental advantages at the production level, the apparently conflicting principles of ecological interdependence and national sovereignty can be positively reconciled because, by producing and exporting such products rather than others, a country takes better care of its own resources and environment and simultaneously contributes to the protection of the global environmental system.

III. PRODUCTS WITH ENVIRONMENTAL ADVANTAGES

18. Environment-friendly attributes, as discussed in the previous section, can be identified in a large number of products. In this section, a systematic review is undertaken of the principal groups of such products and of the significant environmental advantages that they can claim, as well as the principal environmental disadvantages which may be associated with them and most of which can be relatively easily eliminated. This review also provides an initial assessment of the market situation and potential for some specific products. Important factors, including the regulatory framework, which affect their market share are also covered. Emphasis is put on the products supplied by developing countries.

19. The products with claims to environmental advantages are classified into three groups according to their perceived potential in terms of market size and acceptability by the users, be they consumers or industry. Although this division is necessarily somewhat arbitrary, it provides an analytical framework which helps in identifying priority issues as well as policy measures.

20. The first group comprises environmentally preferable products which have currently established markets. For some of these products (such as recycled products), the markets are already very large but are expected to grow even further. For some others (such as biomass fuels and organically grown products) markets have the potential to grow relatively easily and become globally significant under certain conditions discussed below.

21. The second group includes products with environmental advantages which have considerable potential but the markets for which are not sufficiently developed. The enlargement of these markets is mainly dependent on variables different from the first group. The determining factor for these products, which are mostly inputs to production processes, is acceptance by the users.

22. The third group is made up of "niche" items such as non-wood forest products and natural inputs into agriculture. Even if demand for these products rises as a result of an acknowledgement of their environmentally positive attributes and better marketing strategies, supply constraints are likely to prevent them from becoming mainstream items.

A. Products with relatively large and established markets
1. Reusable and recycled materials/products

23. Within the panoply of materials/products with claims to reducing environmental stress, reusable and recycled materials have a special place. First, in volume terms, reusable and recycled materials account not only for the lion's share of materials with claims to environmental advantages currently utilized, but represent for a good number of key industrial raw materials such as steel, wood, aluminium, copper, nickel and natural rubber a sizeable share (between 20 and 50 per cent) of total consumption. Secondly, markets for reusable and recycled materials have rapidly expanded, in particular in developed countries, in recent years. In several cases, e.g. wood and aluminium, secondary materials have been the most dynamic element in meeting demand growth for raw materials. Thirdly, public awareness and regulatory activity of governments in the area of reusable and recycled materials are much more pronounced than for other materials/products with low environmental stress. Finally, the scale and costs of many reuse and recycling schemes, notably in developed countries, are leading many governments to employ or experiment with various forms of full cost pricing, breaking new ground as regards the internalization of environmental costs.

24. Reuse⁹ and recycling¹⁰ of materials are not new phenomena; what is new is the revived, in particular public, interest in them and the rapidly rising volumes of materials being recycled and, to a lesser extent, reused. The driving forces behind this development differ however between developed and developing countries. In the former, the enhanced consumption of reusables and recycled materials is chiefly fuelled by shrinking disposal sites, tough disposal standards and high disposal costs. In the other countries many industries are dependent on reusable and recycled materials because of constraints on the availability of virgin materials.

25. Although there are some cases where material reuse and recycling are mutually exclusive, e.g. washable crockery and cutlery versus throw-away substitutes made of paper or plastics, in general, reusable and recycled materials are of a supplementary nature, e.g. refillable beverage containers for local distribution systems and recyclable containers for long-haul distribution, or coexist, e.g. breaking scrapped cars to recover reusable parts and sort the rest for recycling. Reuse can hold out additional savings in resource consumption, emissions and waste prevention vis-à-vis recycling; the choice and balance between reuse and recycling, however, have to be weighed up carefully for every material/product.¹¹

26. The use of secondary materials versus primary has expanded steadily for almost all important industrial commodities but zinc during the past two decades. The consumption of secondary materials increased steeply for copper, steel, nickel, tin and wood. The recycling rate (calculated as the ratio of recovered material used for recycling to industrial production measured at semi-fabricates level) for the most important industrial commodities (i.e. aluminium, copper, steel, nickel, lead, tin, zinc and wood) varies between 25 and 50 per cent for the developed countries and 2 and 40 per cent for developing countries.

27. Reusable and recycled materials can, under certain conditions and up to a certain level, not only reduce the overall consumption of virgin materials but also relieve environmental stress in terms of waste disposal and air, water and soil pollution. Environmental stress created by reusable or recycled materials is dependent on (a) the type and quality of the scrap or residues to be recovered, and (b) design and material selection which is conducive to reuse and recycling. The reduction of environmental stress based on enhanced consumption of reusable and recycled materials can be considerable.¹² However, as several examples demonstrate,¹³ recycling is not a cure-all.

28. Based on the recognition that the market, left to itself, often prefers virgin to reusable and recycled materials, if only for their greater consistency of quality, many governments, notably in developed countries, have, in the last few years, created a rigid regulatory environment with a view to encouraging reuse and recycling. The surge of regulatory activity has however in most cases taken place at such a rapid pace that (a) the scientific knowledge concerning the overall consequences of the regulatory measures has been overtaken by the political momentum, (b) many recycling schemes rely on significant explicit or implicit subsidies to create or expand the markets for recycled materials,¹⁴ and (c) there is a danger that meeting imposed targets may cost society more than is saved by economizing on raw materials, emissions and waste disposal.

29. Faced with the challenge of having to take back products, manufacturers in many developed countries increasingly feel obliged to rethink in a radically new way the choice of materials, product design, manufacturing and service processes. Companies are starting to take the disposal of a product increasingly into account while designing it and selecting input materials ("cradle-to-grave concept").

30. This new perception has three general consequences. First, it will affect the demand of manufacturers for primary materials in quantitative and qualitative terms. To what extent and how producers of virgin materials, in particular in developing countries, will be affected is as yet unclear and needs to be analysed

on a commodity-by-commodity, and, in some cases, on a country-by-country basis. A recent UNCTAD study on the relative position between ferrous scrap and iron ore in the input mix of steel production, for example, concluded that deteriorating ferrous scrap quality made it unlikely that the rate of recycling would increase any more in the foreseeable future.¹⁵ Secondly, the anticipation by manufacturers of the disposal of a product may influence the relationship between the consumption of reusable and recycled inputs. Reusables are likely to gain ground at the expense of recycled materials, in particular in areas where recycling rates surpass optimum levels. Thirdly, the concern of manufacturers for disposal of their products (in particular, rising costs of disposal, recuperation, sorting, upgrading and reprocessing of waste) will step up pressure on governments to internalize environmental costs and resource values. It can be expected that, in particular in developed countries, waste disposal charges and liabilities will be drastically increased and that, as outlined in the White Paper of the European Commission on Growth, Competitiveness and Employment, resource taxes will be levied while simultaneously decreasing social charges to employers, thus making the labour inputs cheaper.¹⁶

31. For developing countries, the enhanced consumption of reusable and recycled materials is both an opportunity and a constraint. On the opportunity side, for countries short of non-renewable and some renewable (e.g. natural rubber, wood) resources, increased consumption of reusable and recycled materials can contribute to coping with problems of resource scarcity and domestic waste disposal.¹⁷ An increase in the use of recyclables may lead to a decline in prices of, for instance, scrap metal and have beneficial effects for scrap using industries, including those in developing countries which are significant scrap importers. Furthermore, despite international agreements which ban or complicate international trade in certain recoverable wastes, various developing countries can be expected to profit from a more active participation in the international division of labour of recovering, sorting and upgrading materials for reuse and recycling, provided that cheaper labour inputs offset additional transport requirements. As far as primary commodity producing countries are concerned, changes in material choice of manufactures triggered by reuse and recycling may increase demand for several virgin materials, e.g. jute, cotton, direct reduced iron.

32. To what extent the trend towards enhanced consumption of reusable and recycled materials will lead to additional demand for various virgin materials is difficult to predict as, (a) the extent of and incentive for consuming reusables and recyclables differ significantly between countries, and (b) technological and policy changes encouraging reuse and recycling are either still at an incipient stage or hard to forecast.

33. As far as constraints are concerned, for producers of several non-renewable virgin materials, the enhanced global consumption of reusable and recycled materials has the potential to put a brake on growth of primary commodity consumption worldwide.¹⁸ The risk seems to be a potential one in some cases, e.g. iron ore, tropical timber, natural rubber, and a real one in others, e.g. aluminium, copper, zinc. There are also huge differences between commodities and regions/countries.¹⁹ As information on environmental regulations, environmental impact assessments of reusable and recycled inputs and the likelihood of substitution between secondary and primary materials at the

commodity and country levels is rudimentary or incomplete, more systematic analytical work and a regular dissemination of information are necessary to evaluate the role of an enhanced consumption of reusable and recycled inputs and assess the consequences for primary commodity producers in developing countries.

2. Biomass fuels

34. The growing worldwide concern about the increase in greenhouse gas emissions and local concerns about pollution have led to more attention being focused on the potential use of biomass fuels, and the improvement of technologies for economically viable production. This increased interest in biofuels, principally in the European Union, the United States, and Japan, could well usher in a new era in energy use and entail interesting export opportunities for developing countries. It is of great importance that developing countries follow these developments, not only because of the potential impact on their own energy and environmental policies but also so that those countries in a position to produce substantial amounts of such fuels can benefit from any export opportunities. Moreover, improvements in technologies which favour the use of biomass fuels can enable developing countries to reduce import dependence for fuels. However, in countries without surplus land and agricultural labour, shifting resources from food and other production to biomass feedstock can have adverse economic and social effects.

35. There are several types of biomass fuels, which can be produced from a wide range of inputs, including many cash crops, wood, and even waste. Ethanol and methanol are both bioalcohols. Ethanol is produced mainly from sugar-rich agricultural products, whereas methanol can be made from natural gas or any carbon-rich material such as wood.²⁰ Biodiesel fuels (also called diester) are mostly based on vegetable oils. Gaseous biofuels can be obtained from agricultural products, crop residues and wood.

36. Both the bioalcohols and the biodiesel fuels can be used in varying concentrations in blends with gasoline or in their pure state in engines that are designed for this purpose. The use of biogas is mainly for electricity generation. The principal reduction in environmental stress resulting from the utilization of biomass fuels is in respect of the global commons. The CO₂ cycle is neutral for biofuels. Biomass absorbs carbon dioxide from the atmosphere. If new biomass is grown as fast as old biomass is burnt, there is no net change in the amount of carbon dioxide in the atmosphere. An added environmental advantage is that the creation of new biomass plantations brings about a one-off reduction in carbon dioxide up front, before the system settles down into its steady state.

37. Environmental effects related to the cultivation of biomass crops depend on the agricultural practices applied and the type of crops replaced. As for all agricultural production, inputs that can be used for biomass production are varied, and bear different environmental characteristics. In general, the more intensive the intended yield, the higher the pressure on the environment. As biofuels are not targeted to human consumption, however, standards for the quality of crops and for levels of pesticide residues could be less stringent, with a concomitant risk of increased chemical use and pollution of soils and watercourses. Especially in the case of the substitution of traditional crops

by large-scale monocultures, biomass feedstock production could therefore lead to increased environmental stress.

38. During both the fermentation and the production processes of ethanol some liquid and solid pollutants are generated. However, the characteristics of these pollutants are generally well known, and waste treatment technologies are available for their control. Relatively little information is available about the environmental characteristics of biomethanol plants.

39. During the gasification of biomass feedstocks, some dust, waste water, and ash are generated. The ash waste from biomass can be used as fertilizer, however, unlike the waste from coal gasification which must for the most part be landfilled as a hazardous waste. Apart from the reductions of C2O emissions mentioned above, biomass fuels generate mixed results for atmospheric pollution in the later stages of their lifecycle.

40. Currently, when compared to prices of fossil fuels, biofuel costs twice or even three times as much. When uses that can be made of co-products and by-products of biomass fuels are taken into account, however, the competitiveness of these fuels improves. Moreover, improvements in biomass-related technologies (see box 1) and possible increases in petroleum prices, are likely to make biofuels more competitive. It is estimated that cost reductions in the United States in biofuel production will reach more than 10 per cent of the current costs in the foreseeable future.²¹

41. The main reasons for an increase in petroleum prices which could make biomass fuels more competitive include the inherent exhaustible character of fossil fuels, and the possible increases in extraction costs²². Another reason for fossil fuel price increases could be the internalization of external costs, by means of policy measures (for example CO₂ taxation). However, fossil fuels enjoy the benefits of a more efficient organization of production and distribution, which keep costs down.

42. The key factors regarding commercial opportunities for stubiofuels are policy decisions by governments in terms of regulations such as fuel specifications and government procurement principles, and economic instruments such as taxes and subsidies on both fossil and biomass fuels as well as on biomass fuel feedstocks.

43. In both Europe and the United States, programmes to develop alternative clean air fuels are multiplying, partly in response to the need to reduce greenhouse gases and address other environmental concerns such as local air pollution, and partly to develop new uses for crops and idle agricultural land. Whereas ethanol is currently the prime commercialized alternative fuel in the United States, lagging only behind Brazil, in Europe interest is strongest in biodiesel made from vegetable oils, particularly rapeseed.²³

44. In 1993 a European Communities subsidy programme went into effect that will pay farmers \$300 per hectare to take land out of surplus food production and put it into oilseed production for non-food use. European production of biodiesel, according to one estimate, is projected to match the fuel consumption of 250,000 cars and trucks very soon.²⁴

Box 1: Alternative technologies for biomass fuel use and production

Several new technologies have been developed that can make bioethanol derived from sugar cane (or other feedstocks) more competitive.

Aquahol

The "aquahol" technology was originally developed by Rolls-Royce and T.R.W. It concerns a 50:50 ethanol blend of water. Unlike the current "gasohol" blend of ethanol with gasoline that will be mandatory in the United States starting in 1995, the 50% water/alcohol mixture is injected into the conventional engine rather than blended into the gasoline. This process has been recommended by the United States Department of Agriculture as being 800% more efficient than gasohol. Other benefits include longer engine life, fewer tune-ups and lower requirements for high octane gasoline.

With regard to environmental benefits, this alternative is claimed to produce less NOx and aldehyde. Other significant benefits of aquahol are the oxygen and hydrogen emission benefits. By molecular weight, water has about 89% oxygen versus most gasoline chemical additives which have only about 6%. Since it is now mandated that all gasoline in America be oxygenated, water could eliminate all chemicals including the current methyl tertio-butyl ether (MTBE) additives.

Splitting of sugar cane

Compared to the conventional processing of sugar cane by milling or crushing, the splitting of sugar cane has some advantages. First, this new technology, developed in Canada during the early seventies, requires less energy than crushing or milling. Second, the splitting process produces a valuable by-product named "cane-rind" instead of the crushed or milled bagasse. Since the rind is not crushed, it can be used to make a strong fibre board that appears to have structural advantages compared to conventional chipboard made from wood chips. It is also simple to rinse the sugar or sucrose residue, thereby eliminating fermentation. The process also provides an alternative source of paper pulp or any of the numerous products now produced from the cutting of trees.

New varieties of sugar cane and sweet sorghum

The ethanol part of the "aquahol" blend can be based on biomass crops (sugar cane and sweet sorghum) originating in developing countries. New varieties of plants now seem to be available that grow all the year round with lower water requirements and less susceptibility to diseases than current crops. The minimal water requirements are especially important in countries that have droughts. The year-round aspect is also very important for developing countries, since many rural agricultural areas are losing their residents to large cities because of the lack of the year-round employment and lower earnings.

45. In 1992 the Commission of the European Communities adopted a draft directive fixing a tax structure for biofuels at levels notably lower than those applicable to fossil fuels. The aim would be to reduce the difference in costs between the two alternatives. Germany, Switzerland and Italy have exempted biodiesel from all sales and road taxes. Austria has exempted biodiesel from 95 percent of its highway tax. In Sweden and Finland, biomass energy obtained mainly through gasification is economically viable because "harm taxes" levied on fuels such as petroleum products that harm the environment lead to the internalization of some environmental externalities associated with them.

46. In the United States, the Clean Air Act requires that by January 1995, the country's smoggiest cities must begin using reformulated gasoline (called gasohol). To reformulate gasoline, the refiners will add an oxygenate - either ethanol, mostly made from corn, or methanol, usually made from natural gas. The oxygenate fuel additive market is highly competitive, and bioalcohols face high barriers to entry into a market that is highly dominated by the fossil fuel industry, which favours methanol. However, the Environmental Protection Agency's proposed rule would require at least 30 per cent of the oxygenate to come from renewable sources - that is ethanol. If implemented, this will require an estimated 500 million gallons of new production above the current annual capacity. It is believed that this production level can be achieved by United States producers by early 1995.

47. In the near future, and in spite of the possibly significant positive impact of regulations on biofuel demand, neither Europe nor the United States is likely to offer promising opportunities for biofuel exports from developing countries because the bulk of the feedstock can be provided from idle land. However, both the interest in and the technological support for biofuels could potentially increase biofuel use worldwide and affect positively, in the longer run the export opportunities for developing countries with large potential to produce biofuels. Agricultural commodities' costs bear a large share in the total cost of these fuels and this presents potential export opportunities for developing countries which can produce feedstocks and biofuels competitively. However, the selection of agricultural commodities as feedstocks and the price competitiveness of biofuels produced in different countries are very sensitive to, and dependent upon, policy decisions such as payments of subsidies. As a result of the Uruguay Round the importance of these policies will decline, but in any case it is mostly the industrialized countries that can afford whatever support is allowed under new trade rules.

3. Organically grown products

48. There are various definitions of organic²⁵ agriculture and various standards used for certifying products as organic (see box 2). According to the FAO, "organic agricultural products are the products of organic farming which employs cultivation methods avoiding environmental damage and chemical inputs"²⁶, the latter being one of the principal non-point sources of water pollution, particularly in developed countries. The United States Department of Agriculture's definition of organic agriculture is "a production system which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators and livestock feed additives".²⁷

49. The reduction of environmental stress by organic production occurs principally at the upstream stage of the product's life cycle, in principle locally, but also possibly, at a transborder level. Moreover, consumption advantages also occur because any possibility of adverse health effects due to toxic residues is eliminated.²⁸ For the consumers of products grown domestically both aspects are equally important environmentally preferable attributes of organic products. For traded products, however, the advantages at the consumption stage appear to be the dominant, but not exclusive, attribute of organic products.

50. Although consumer interest in organically grown agricultural fibres, such as cotton, is rising, the concept of an organic product is generally associated with food items. The share of organic products is currently about 0.5 per cent of the food market in industrialized countries, but it reaches 2 per cent in Denmark, Austria and Germany. Experts expect that it will reach 8 to 10 per cent by 2000.²⁹ Although in many instances organic products are sold in "niche markets", they have already entered mainstream markets through products such as baby foods. Organic cotton, besides being an input to fashionable clothing, has considerable demand from medical gauze and baby clothing manufacturers.

Box 2: Certification of organic products

In line with the overall definitions of organic production, strict standards are set for products to qualify as "organic". Work at the intergovernmental level is carried out at the Codex Alimentarius Commission serviced by FAO and WHO. Some countries have national legislation on standards for organic farming. These include the United States Organic Food Production Act (1990) and the European Union's Council Regulation 2092/91.

The International Federation of Organic Agriculture Movements (IFOAM) which has over 500 member organizations in more than 80 countries has accepted a set of "Basic Standards of Organic Agriculture and Food Processing", covering the process of conversion to organic agriculture, choice of crops and varieties, rotations, manurial policy, pest, disease and weed management, growth regulators, and use of plastics. Since local conditions are so varied, national and regional organizations are needed to develop standards appropriate for the conditions prevailing in each country or region.

Individual certification programmes have been developed for specific products on this basis. For example, the ECO-OK Banana Certification of Rainforest Alliance in New York includes requirements to maintain or establish vegetated zones in order to filter sediments and agrochemicals from drainage into waterways, provide animal migration corridors along rivers, and shelter populations from the drift of sprayed agrochemicals along roads and adjacent to housing; restrictions on new plantation development in order to protect certain types of lowland tropical forests, national parks and local communities; requirements for proper management and disposal of organic, liquid, plastic and solid wastes including commitment to reducing, reusing and recycling wastes; provision of environmental education and training programmes for plantation workers; reclamation of unproductive plantation lands through forestry, and conservation of natural zones that are not part of the productive plantation, but are within property limits.

51. Organic products currently sell at prices which are from 20 per cent to more than 100 per cent higher than conventional products, but the premiums are declining.³⁰ Surveys indicate that demand could be more than doubled if the consumer prices for organic products were not more than 30 or 40 per cent higher than conventional products. This is roughly equal to the price of a premium conventional product. Moreover, demand would be likely to increase considerably if such products were easily available and consumers could get them without a greater effort than that needed to obtain conventional products³¹ (see box 3)

52. Another factor which will increase consumer demand for organically grown produce is the decision by certain industrialized country governments to make conscious efforts to switch their own agriculture to organic methods. For example, the Swedish parliament has decided to demand a governmental programme for reaching the goal of 10 per cent of Swedish agriculture converted to organic agriculture by the year 2000.³² As consumers are presented with greater numbers of domestic organic products, their preference for organic products in general, including imported ones, is likely to increase as well.

53. Organic products are either consumed directly or enter the production of final products as inputs. In the first case, the consumer pays the total price differential between the organic and conventional products. When the organically grown item is an input, this differential should not make a major difference to the price of the final item because the raw material typically comprises only a minor part of the total cost of the final good. For example, in the case of regular chocolate bars, the cost of the final product would increase by only about 1 to 2 per cent if twice the current market price was paid to organically grown "fair trade" cocoa.³³ In the case of "organic" cotton garments, the cost of the final product is particularly influenced, not by the price of cotton, but rather by the high price of acceptable soaps and dyes (often produced by a very small number of companies in developed countries) and the high fees paid to assessment and labelling companies, rather than the price of cotton. Certification expenses may account for up to 20 per cent of costs for small organic farmers.³⁴

54. Although yields are lower in organic agriculture by about 30 to 50 per cent for both tree crops such as coffee and field crops such as cotton or wheat,³⁵ expenditures on external inputs are lower and the current price premiums may lead to higher income per hectare. Lower yields do not therefore seem to be the principal problem for producers. An important cost that discourages a switch to organic farming is the need to leave the field fallow (in the case of field crops) or apply principles of organic production (in the case of tree crops) for two to three years before the crop can be certified as organic, thus foregoing significant revenues during this period.

55. According to traders in organic products, for the time being, there is an unsatiated demand. Whatever is produced organically is easily sold. As a consequence, more producers are turning to organic production on their own initiative, as opposed to the 1980s when such changes were prompted by consumers. For the expansion of exports by developing countries of organic products which compete with local organic production in developed countries, the assistance and subsidies received by the latter are an important factor. It is expected, however, that production in the main organic markets will not be enough to meet

Box 3: Organic coffee

For the indigenous Indian communities in southern Mexico, shifting from conventional to organic coffee production was economically and politically motivated. They upgraded their tree stocks by replanting newer, shorter, high-yielding and disease-resistant varieties, strengthened natural topography by planting on contour lines in secondary jungles, and minimized external inputs by using composted bean pulps and other farm by-products as fertilizers. Because there was less need for agrochemicals, they avoided incurring loans from intermediaries, the terms for which included exclusive purchase rights. They then formed an intercommunity union and obtained an export license.

The union has been selling to Europe since the mid-1980s through fair trade organizations. Marketing their produce as organic earned them a premium which, together with their increased share in value added, has been ploughed back into communal development activities. The union has since set up an infrastructure for the transport, storage, processing and export of their product. Its contributions to public service include an improved educational system in the remote communities, a public transport system into the otherwise inaccessible mountain regions, shops stocked with basic necessities and a medical insurance system. As of the early 1990s, the union has a membership of 37 communities with a total of more than 3000 families. For these communities and families, organic farming served as a vehicle towards a better standard of living, in addition to ensuring the sustainability of agriculture.

The market for fair-trade coffee is about 2 per cent in Germany, 2.5 per cent in Switzerland and 4.5 per cent in the Netherlands. Coffee grown under strict organic conditions supplies only 0.1 per cent and 0.2 per cent of the German and United States markets respectively. As of 1992 there were about 40 organic coffee "projects" world wide, holding some form of certification. The countries from which organic coffee is imported include Brazil, Costa Rica, Dominican Republic, Guatemala, Haiti, India, Indonesia, Madagascar, Mexico, Papua New Guinea, and Peru. The world's largest supplier of organically grown coffee with third party certification is Papua-New Guinea, which exports about 10,000 60-kg bags a year to Germany, Australia and the United Kingdom.

Organic coffee currently on the market comes mostly from plantations which have links with organizations in consuming countries. These links have been instrumental in organizational formation, technical assistance, trade facilitation, and marketing distribution. Marketing is done principally through fair-trade organizations, which provide assistance in surmounting certification and labelling requirements of consuming countries, and secure the products a niche in their own distribution outlets. Perhaps one of the best documented fair-trading successes is Max Havelaar coffee, which has an annual turnover of twenty million pounds (sterling), with a fair price guaranteed to some 300,000 small coffee producers in 13 countries. Of the price premium, it has been stated that 30 per cent can be attributed to environmental and 70 per cent to social advantages.

Normally, the cost of raw coffee accounts for only a fourth of the consumer price. The producers receive between 1/3 to 2/3 of this with the intermediaries taking the remainder. Under fair trade arrangements, however, payments are made directly to producers who are usually small-scale holders. It is estimated that currently about a million small-scale coffee growers receive considerably higher prices for their produce. The number of coffee plantation conversions from conventional to organic agriculture is increasing. Combined with the fertility build-up from improved soil regeneration of current organic plantations, a larger and more stable flow of organic coffee into the market is expected in the near future. Although organic coffee commands a premium in the market and its consumption is expected to increase further, there is a limit to the level and frequency with which consumers are willing to pay more. In order to stimulate sales volumes for the smooth absorption of an increasing supply of organic coffee supply, a move to widen distribution from specialty outlets such as natural food stores and fair-trade shops to include supermarkets at a lower premium is being undertaken in Europe.

the demand. In the year 2000, "the degree of self-sufficiency in organic products will be about 60 to 70 per cent in Germany".³⁶ Thus, opportunities will exist for developing countries to fill this gap. One advantage in terms of competitiveness, at least for some developing country producers, is the relative ease of switching to organic production because of generally lower current use of external inputs.

56. It seems inevitable that the price differential between organic and conventional products will become narrower as supplies increase. Producers and traders of organic products believe that some of the supply side factors which cause this price differential such as the relatively small size of shipments and associated higher transport costs, and the need to create, or make use of, marketing outlets outside mainstream distribution networks can be overcome by improving organization and marketing. They expect that organic products will be sold at prices comparable to those of premium conventional products.³⁷

B. Products with considerable potential but rudimentary markets

1. Agricultural fibres as raw materials

57. Agricultural products, in particular fibres, are used as inputs in a wide variety of industrial activities and in construction. Many of these uses are traditional ones, but these products have a considerably larger potential for use in many branches of industry than is currently the case. Estimations on the size of the EU market for plant fibres, when promising applications have been successfully developed, indicate that the increase could be large enough to absorb fifteen times the current EU production of agricultural fibres.³⁸ Thus, the potential for increased imports from developing countries is considerable.

58. Research is being undertaken in both developed and developing countries in order to increase the utility of agricultural raw materials for industry. Work in this area is underway in the United States and the European Union, principally as a means of finding alternative uses for surplus agricultural land, but also emphasizing the environmentally preferable characteristics of natural fibres and other agricultural raw materials (see box 4). Developing countries, on the other hand, put the greater emphasis on finding useful alternatives for their natural products, which are often wasted. There is scope for developing countries to benefit from the active promotion in developed countries, a trend which should increase acceptance and open up new export opportunities.

59. The principal environmental advantage of using natural fibres as industrial inputs rests in their biodegradable and biocompatible qualities. Thus, important benefits exist in the area of waste management. These products are also generally more worker-friendly and easier to handle.

60. The industrial areas where natural fibres can help reduce environmental stress caused by currently used products include packaging, composites and geotextiles.

**Box 4: Alternative Agricultural Research and Commercialization
Center (AARC Center)**

Environmentally preferable commodity-based products frequently fail to reach the market because of the gap between research and the market. Assistance is therefore needed to close this gap. In 1992 the United States Department of Agriculture established the AARC Center which operates on a commercial basis specifically to serve this purpose. The main focus is on providing assistance to private enterprises at the pre-commercialization stage where the costs are the highest and the ability to obtain loans from traditional sources the most difficult. Finance may be obtained from the Center to cover the costs related to the identification of viable markets, testing products for performance and consumer acceptance, verifying the performance of the technology on a commercial scale and obtaining regulatory clearance.

Financial assistance is provided by the Center through partnership arrangements which involve sharing the risk between the agency and the private entrepreneur. A large percentage of the Center's work is with the small firms and entrepreneurs who have virtually no other source of lending.

Assistance provided by the Center covers a wide array of products for industrial uses, with preference for projects that have environmental advantages at the production, processing, consumption or disposal stages. Recent projects that have gained AARC assistance include the following.

(1) The production of "Roll and Grow" kenaf-based grass mat which is entirely biodegradable and helps fertilize the grass seed as it grows. The project, originated by Agro-Fibers Inc., attracted a US\$ 800,000 investment by AARC on the grounds of employment generation impact and environmental benefits. The company expects to carve out an estimated US\$ 50 million niche market in the home gardening industry.

(2) Research into a technology for turning waste straw into a tree-saving source for the specialty paper used in making cardboard boxes. The project has received a contribution of US\$ 350,000 from AARC on the grounds that, if successful, it could generate substantial environmental benefits. These include replacing wood with annually renewable straw in certain paper manufacturing processes, helping eliminate the air-pollution problems caused by farmers' burning waste straw and turning a disposal problem into a new market for farm straw.

(3) Production of ethanol from low-cost, renewable sources such as grain sorghum stalks, switchgrass and other woody materials. Since the United States need for ethanol as a less-polluting, crop-derived alternative to petrol is expected to increase steadily to comply with the strict emission standards set by the 1990 Clean Air Act, the AARC decided to contribute US\$ 1 million to Arkenol Inc. for a project to convert biomass to ethanol.

(a) Packaging

61. Packaging including the use of twine for hay and straw bailing, is an important area where natural fibres such as jute, sisal and kenaf can claim environmental advantages because of their biodegradability and lower energy use. Initial analyses suggest that in packaging, natural fibres are more environmentally sound, and thus less costly to society, than competing synthetic materials, particularly at the disposal stage.

62. However, certain local environmental problems also arise at the production and processing stages of hard fibres.³⁹ These include surface and groundwater pollution and release of toxic substances and methane caused by organic waste. There are, however, relatively simple ways to remedy these problems. For example, the unrefined oil now in use for batching could be replaced by biodegradable oils which do not affect human health. Some changes in extraction habits and the use of organic waste materials would also significantly and easily increase the environmental advantages of hard fibres over alternative synthetics. Some other measures such as water treatment, however, can be rather costly.

63. The competitiveness of natural fibres in the packaging industry is affected by the complex packaging regulations applied in the high-income countries, which put very heavy emphasis on recyclability. While such measures would imply rising costs for plastic packaging materials, the widespread implementation of legislation concerning plastic waste recycling could significantly alter supply/demand balances, and contribute to the oversupply of plastics and their continued relatively low prices.⁴⁰

64. Competitiveness will also be affected by the development of "degradable" plastics, made either of vegetable oils or by converting starch from various crops into polymers. The environmental performance of some such materials has not been found to be as satisfactory as that of natural fibres.⁴¹ Nevertheless, recent research is reported to have removed some of the problems such as only partial degradability.⁴² Although an increase in the utilization of biodegradable plastics could harm the competitiveness of natural fibres, markets for some products of developing countries, such as vegetable oils, would expand subject to competition from developed country products.

(b) Composites

65. Flax, cotton and jute are most frequently used as a substitute for glass fibres in reinforced polymer matrix composites (PMCs). The principal environmental advantages of natural fibres over glass fibres in this area are biodegradability and combustibility. Burning of glass fibres leaves much ash and recycling is possible for only a very limited range of composites containing glass fibres.

66. Composites are used for their greater strength and stiffness compared to other materials. Various applications for plant fibres can be found in the automotive industry, for example, in brake and clutch linings. Replacement of asbestos by cellulosic fibres with high wear resistance is being studied by the industry. But conventional production techniques in the automotive and engineering industries are strongly anchored and therefore composite processing

and especially plant fibre PMCs are difficult to introduce.⁴³ This is exacerbated by the lack of readily available information on relevant fibre characteristics.

67. A related area where natural products can reduce environmental stress is in building materials. "Despite environmental problems, asbestos fibres are still the most applied reinforcement fibre in inorganic matrix composites" such as cement and concrete.⁴⁴ In developed countries wood pulps and flax are the main products with environmental advantages used as a substitute for asbestos. Among such products of developing countries, bamboo, sisal and reed have the desirable qualities and potential for expanded utilization.

68. It is of great importance for industrial users of new raw materials to have information concerning health aspects but such information for cellulose is lacking. Generally, it is assumed that cellulose do not give rise to health problems like asbestos or glass fibres. Scientific evidence supporting this hypothesis will promote the introduction of agricultural cellulose fibres in industrial uses.⁴⁵

(c) Geotextiles

69. In civil engineering large quantities of geotextiles, mainly based on synthetic fibres, are used in road construction and hydraulic engineering for erosion control, soil stabilization, drains, foundations and soil separations. The consumption of geotextiles in the industrialized countries grew 70-fold between 1980 and 1990. Some experts forecast a further doubling by the year 2000.⁴⁶ As modern civil engineering practices are adopted in the developing countries, markets for geotextiles may boom there as well. In applications where geotextiles are not permanently required, or as temporary support for rooting plants on civil constructions, plant geotextiles can be used. In these cases, jute, coir and straw have significant potential. Being biodegradable, they decompose into humus, thus eliminating the need for post-installation work at the end of their useful life and consequently saving costs. Another potential use is in landscaping: the AARC (see box 4) is participating in the financing of a project to develop kenaf mats with grass seeds implanted in them as an environmentally preferable means of seeding lawns. The potential for geotextiles based on plant fibres will increase as biodegradability is designed or programmed into the product and the lifetime becomes controllable.

2. Alternative wood sources and wood substitutes

70. These products which reduce environmental stress by limiting deforestation include non-traditional timber varieties, with a wide range of potential uses from construction to furniture manufacturing, and other products which can be used as alternative raw materials for the pulp and paper industry (see box 5).

71. Traditionally, certain types of trees such as rubber and coconut trees have been destroyed, mostly by burning, when they become old. Even in Malaysia, the second largest producer of rubberwood after Thailand, about 70 per cent of the rubberwood is burned on the felling site and, at the sawmill, 65 per cent of what is received is discarded.⁴⁷

72. In their natural form these trees produce non-durable wood, but new research in the producing countries⁴⁸ has resulted in processes by which these woods can be treated and preserved. The uses of properly treated coconut wood include, apart from furniture, other wooden household items, fence posts, and electric power and communication poles. Its use, however, is less developed and it is a relatively new item compared to rubberwood which has penetrated foreign markets, in particular, as furniture and parquet flooring. In 1991, Malaysia exported \$160 million worth of furniture, of which 80 per cent was made of rubberwood⁴⁹ whose price tended to be lower and more stable than that of other indigenous species for the same end uses.⁵⁰

73. Increased utilization of these trees reduces environmental stress, in particular atmospheric pollution, on two accounts. First, they can be substituted for other types of trees that come from forests, thus helping to conserve forest resources, with positive impacts on carbon absorption and climate change. Secondly, increased utilization of rubber and coconutwood reduces the atmospheric pollution caused by their burning on site.

74. The economically available volume of rubberwood logs in the world is equivalent to the total volume of wood exploited from about 0.6 million hectares of tropical rainforest on an annual basis.⁵¹ The recoverable cocowood volume can reach 1 million cubic metres annually in the Philippines alone.⁵² This would be roughly equal to 20 per cent of this country's non-coniferous industrial roundwood production.

75. It has been estimated that rubber trees could provide about 0.3 per cent of the world's timber needs during the last decade of this century.⁵³ In some rubber-producing countries, rubberwood already makes up a significant proportion of total timber production. In Thailand, Sri Lanka and Malaysia, where the rubberwood industry is most developed, this proportion reaches 24 per cent, 19 per cent and 6 per cent, respectively.⁵⁴ In other rubber-producing countries such as Viet Nam and China, the potential for increased supplies is considerable.

76. Trees which have been badly tapped and poorly maintained do not produce wood suitable for economical and effective processing. Unfortunately, the growers in most desperate need for alternative sources of income from their trees, i.e. independent smallholders, are those most likely to have poorly maintained trees. Other problems concerning supply which need to be resolved include shortage of raw material supply during certain periods because supplies are dictated by the replanting pattern of plantations, the low recovery rates and transportation logistics.⁵⁵

C. Niche products

1. Non-wood forest products

77. Some non-wood forest products used as food, industrial inputs and health care ingredients can also claim to reduce environmental stress because of the added value they bring to the forest cover, which promotes conservation. It can be argued that the higher the earnings from sustainably managing a resource, the greater will be the tendency to do so. "Managing tropical forests only for

**Box 5: Agricultural crops and wastes as raw material
for the pulp and paper industry**

Many crops, such as sugar cane, flax, various kinds of grass, reeds, straw, hemp, jute and kenaf are potential raw materials for the paper industry. The environmental implications of using annual crops rather than pulp from sustainably managed forests and waste materials of the timber industry are not yet fully understood. The proponents of using annual crops point out examples such as kenaf paper which uses less energy than pine, requires minimal chemical inputs in both field and mill operations, and produces wastewater which, when treated, can be used to irrigate nearby fibre fields. Moreover, compared with wood-pulp paper, kenaf paper is stronger, whiter, less prone to yellowing, capable of sharper photo-reproduction and more user-friendly because of better ink adherence.

One of the problems with using annual plants instead of wood is the relative bulkiness of the former. This implies that transport, storage and processing need more volume than with wood. Annual harvesting requires a year-round storage system. Moreover, climatological conditions affect not only the quality of fibres but also the quantities supplied, which become unpredictable. Inconsistency of fibre quality can be diminished by improved fibre extraction methods, which are in an advanced stage of development.

The pulp and paper industry also provides an environmentally preferable use for many materials which are normally wasted and disposed of in an environmentally undesirable manner, for example, thrown into waterways or burned. For example, waste straw is mostly used for making specialty paper grades, e.g. for cardboard boxes in Europe, particularly in Spain and France. Projects are also under way in the United States. Various plants which are considered as environmental nuisances, including water hyacinths and several grasses, have been identified as environmentally preferable raw materials for paper because their use prevents potential environmental problems such as clogging of waterways and methane emissions.

One major problem impeding increased use of alternative raw materials for the pulp and paper industry is the lack of sufficient knowledge about the behaviour of fibres and their chemical composition in relation to paper making. Increased information flows could therefore generate large benefits in this area.

timber to the exclusion or neglect of non-timber products may fail to maximize the social value of the scarce resource and to ensure its sustainability over time.⁵⁶

78. Calculations on the value of the intact forest compared with alternative uses and the value of non-timber products compared with wood, show that when necessary adjustments are made the financial value of the forest can be two or three times higher than that of alternative uses for the land, such as cattle ranching or plantation management.⁵⁷ The value of non-timber forest products compared to that of wood is also significant. For example, the value of six principal non-timber products foregone because of agropastoral expansion into forest areas in Brazil was calculated to be between 11 and 21 per cent of the value of the wood.⁵⁸ It has been argued that although a specific timber harvest can have a much greater value than that of non-timber products, the net present value of the latter when measured over a longer period of time can sometimes exceed that of the timber harvest.⁵⁹ So far these products have not received much attention from the governments of the countries producing them because their value in terms of export earnings, in comparison to timber, has been rather small.

79. Realization of the importance of potential earnings from such "exotic" products for encouraging forest conservation could considerably increase the attractiveness of these products to consumers who are concerned with the effects of deforestation on climate change and biodiversity as well as with the living conditions of forest dwellers.

80. The significance of non-timber products for specific local communities becomes clearer when it is considered that timber is exploited by large firms, whereas non-timber products are usually produced by local residents of the forests, and that processing of these products is a labour-intensive activity (see box 6). "Harvesting systems for non-timber products usually leave more benefits in the hands of local communities than is the case with industrial timber exploitation where benefits accrue to urban-based entrepreneurs".⁶⁰ This is particularly important because "conservation of a rain forest perceived by the local populace to be of direct economic importance is far more likely to be successful in the long term than is conservation for its own sake".⁶¹ However, the dynamics of non-wood forest exploitation abounds with examples where "when a forest acquires greater value in the society, it is appropriated by external entrepreneurs at the expense of local communities".⁶² Thus, land and resource rights lie at the heart of the problem. Forest residents are unlikely to protect forest resources if they do not have clear rights or guaranteed access to these resources or if they feel that at any time they can be displaced by outsiders.

81. A large proportion of the value added of the final product is generated at the marketing stage.⁶³ Thus, the more the local producers participate in the marketing of their products, the more of the value added will accrue to them. Establishing new marketing channels, however, is an expensive operation. Marketing through existing institutions, therefore, including those established by exporting countries for other products such as timber and other agricultural commodities, appears to be a cost effective solution in the short term. Most food products from tropical forests have well defined and relatively short harvest seasons. Markets for such products, however, could easily be sustained

Box 6: Brazil nuts

Brazil nuts (also called Amazon nuts) are, together with rubber, one of the main non-wood forest products extracted in the Amazon region. They represent a significant source of income for some local communities. Brazil supplies about 75 per cent of the world market, followed by Bolivia and Peru as the other principal exporters.

Generally, dispersed extractors collect the Brazil nuts and deliver them to middlemen. These transport nuts to more central collection points where buyers take delivery. The nuts are then shipped to processing plants which are highly centralized in urban areas of Brazil. After processing and packaging the nuts are mostly exported. 55 per cent of the market is controlled by three of the major processors/exporters, all owned by the same family, Matran.

As the internal market represents only 3-5 per cent of total production, the Brazil nut industry is highly dependent on exports. The United States is the world's largest importer of in-shell nuts and it is second after the United Kingdom in imports of shelled nuts. Brazil nuts comprise about 1.5 per cent of the international edible nut market but their share has been constantly falling over the last two decades as a result of a decline in total production, in favour of other types of nuts.

To reverse this decline and gain market share in the markets of other countries, two main problems need to be solved: insufficient supply and relatively high production costs.

Deforestation of Brazil nut producing regions caused by earlier policies has cut down production and contributed to the loss of market share. In addition, only slightly less than half the potential area in the Amazon is exploited for the extraction of nuts today. Transportation towards centralized processing plants is too costly to justify their being gathered from isolated sites. Moreover, prices paid to producers may not be high enough to stimulate production as new opportunities open up for extractors to earn more money outside the sector in activities such as prospecting for gold or hiring out their labour.

Prices paid for Brazil nuts at different points of the market chain are derived from international prices and passed down to extractors who receive about 12 per cent of the f.o.b. export price of in-shell nuts. The cost of transportation to processing plants and the earnings of the intermediaries approach 15 per cent and processing costs amount to 50 per cent of the export price. One of the reasons for the very low share received by extractors is the monopsonistic situation of the buyers and the lack of market power for individual producers.

The processing itself involves several time-consuming and labour-intensive stages. In-shell nuts that make it to the market, for instance, have been processed and packed to guarantee a shelf life of 12 months. They have been through seven processing stages, namely, removal of substandard produce, 10-hour oven drying, cooling, classification by size and weight, removal of damaged nuts, dehydration, and waxing. Processing shelled nuts requires more stages and involves higher damage loss. Production costs in large processing units in cities are high, owing to costs of transportation from remote areas, losses due to spoilage during transport and generally higher wage levels in plants located in urban zones as compared with rural areas. Experience from Bolivia shows that small processing plants buying their raw material from the same border region and paying the same price to the extractors are able to export at lower prices than large Brazilian processors.

Among the solutions proposed for increasing the competitiveness of Brazil nuts are decentralization of processing (as economies of scale are insignificant), which could cut transport as well as labour costs and lead to a larger part of final price accruing to the gatherers, while remaining internationally competitive. For example, the Cooperativa Agro-Extractivista de Xapuri, the only small production-processing-export venture, owned and operated by extractors, has been able to double the price paid to them, thanks to a reduction in cost through decentralized processing.

Another option to increase production and lower production costs is to plant Brazil nut trees. Just planting trees close to the extractors and to the processors will lower the time and distances of gathering and therefore reduce the production costs. The time from planting to first commercial production is shorter for planted trees and they can do very well in most soils of the Amazon, being resistant to major diseases and pests even if concentrated or planted in homogeneous stands.

throughout the year if produce were available. Transportation to market is difficult and often must wait until a change of season. All of these factors make the reduction of post-harvest losses, including losses during transport, a high priority objective. To the extent that the product can be sold for a higher price during the off-season, it will also stabilize the price during the peak period of availability.

82. As regards the competitiveness of the "exotic" non-wood forest products, one problem is to introduce them to the market. It seems easier to expand the utilization and trade of products already on the market than to introduce new ones. However, a long term view is also necessary and some of the profits of the current operations can be allocated to diversification into new items.

83. One of the main difficulties concerning the competitiveness of non-wood forest products lies on the supply side. It is often difficult with the current organizational structures to provide the quantities that would be required by even a modest manufacturer interested in using these products. For example, the Xapuri Brazil nut shelling factory produces 70 metric tons (MT) of Brazil nuts per year, whereas 70 MT of peanuts per eight-hour shift are used to produce certain candy bars. Individually, local Brazil nut shelling cooperatives could not convince large companies to use their nuts. By working together, however, producer groups can supply economically viable quantities to users, and thus gain larger market shares.

84. It is important to assure the consumers who are interested in the sustainability of the forest from which these non-wood products come that they are indeed contributing to forest preservation. To this end a monitoring system is necessary to ensure that the production of non-wood forest products does not destroy the forest. Such monitoring and certification needs to be undertaken for each commodity by scientists and forest residents. In the end, it is the local communities whose present markets and future livelihoods will depend on such certification. The authority to monitor and certify should be primarily theirs.

2. Natural inputs for agriculture

85. Some natural products of developing countries with very little or no negative impacts on the environment have a considerable potential to replace synthetic products in pest control. Pyrethrum, mostly produced in East Africa, and neem (see box 7), a tree native to India and Burma but also grown in Africa, are among such products. Some scientists believe that neem, whose products appear to have little or no toxicity to warm-blooded animals, could well be the basis for development of safe natural pesticides.⁶⁴ It is because of these characteristics that natural inputs to agriculture discussed in this section are generally acceptable for use in organic agriculture for pest control.⁶⁵

86. This advantage in reducing environmental stress of agricultural production, including the management of lawns and gardens, could be a significant environment-friendly attribute from the perspective of consumers. Moreover, there are other advantages associated with using plants as a source of pest control. The carbon absorption capacity of plants while they are growing is of

Box 7: Natural pesticides

The neem tree (*Azadirachta indica*), called "the village pharmacy" in its native India because of its varied pharmacological uses, may be the harbinger of a new generation of "soft" pesticides. Extracts from its extremely bitter seeds and leaves are lethal to many pestiferous species but are harmless to beneficial insects, people, and animals. Extraction of active elements is very simple and can be done at the farm level. In trials in the Gambia, for example, neem leaves or seeds crushed and steeped in water or alcohol compared favourably with the synthetic insecticide malathion, and in Nigeria performed just as well as DDT, Dieldrin and other insecticides. Certain plant species, among them wheat, rice, sugar cane, tomatoes and cotton, also take neem compounds as systemic agents, that is, they absorb aqueous neem extracts sprinkled on the soil and transport these throughout the plant system including stems and leaves, where they provide protection from within. Unlike conventional pesticides, systemic agents cannot be washed off by rain or watering. They also provide protection to new growth occurring after application.

Unlike conventional pesticides again, the efficacy of neem as a pesticide does not seem to diminish with continued use, indicating absence of genetic resistance build-up. Entomologists attribute this phenomenon to neem's complex blend of compounds which have diverse functions and affect different parts of an insect's life cycle and physiology. The chemical compounds found in the neem tree's oil disrupt the production of growth hormones in more than 200 insect species and thus prevent the insects from reproducing.

Although stabilization and other advances were already developed by Indian scientists as early as the 1960s, these have not been patented, probably as a token of recognition that the bulk of the groundwork had been done by generations of anonymous experimenters. However, this left their work open to loss of rights to its usage when a firm was granted an international patent. Moreover, what was once an abundantly free resource has become increasingly out of reach to ordinary farmers, with the price of neem seed rising sharply due to the patent-holding company's more attractive purchase price. A prevalent belief in India is that, unless checked, the diversion of neem seeds from community use to industrial raw material will ultimately establish a regime in which the use of neem will be controlled by a handful of commercial entities. A grass-roots campaign in India against what is generally considered a violation of intellectual property rights to collective indigenous knowledge has gained the support of prominent Indian scientists.

Source:

National Research Council, NEEM: A tree for solving global problems, Report of an Ad Hoc Panel of the Board on Science and Technology for International Development, National Academy Press, Washington D.C., 1992.
V. Shiva and R. Holla-Bhar, "Intellectual Piracy and the Neem Tree", The Ecologist, Vol. 23, No. 6, November/December 1993.

global benefit, and their contribution to controlling soil erosion and deforestation is a local benefit with wider potential implications.

87. There are several problems, however, in expanding the use and trading of these products. First, chemical companies have developed synthetic alternatives in the case of pyrethrum and patented the extracts of the natural product itself in the case of neem. Secondly, the supply of these products may not be as reliable as would be required for their expanded use. Thirdly, and perhaps most importantly, the greatest impediment to commercial development may simply be a general lack of credibility, or even awareness of what these products are and what they can do.⁶⁶ Neither the farming sector nor the public in general is well informed of the possibilities of reducing environmental stress by expanding the use of these products. There is room for scientific research to provide a well established basis for all their relevant properties. Equally important issues for ensuring that the producing countries obtain economic benefits from increased utilization are finding ways to resolve the intellectual property problems, establishing an effective marketing structure and providing reliable supplies in sufficient quantities.

3. Products made from agricultural waste

88. Agricultural waste not only reduces the economic benefits that can be realized from the production process but also leads to environmental problems. These problems include water and soil pollution at the local level as well as the emission of methane when the wastes are left to rot and of carbon when they are burned. Making useful materials from agricultural waste would thus help to increase farmers' earnings and reduce environmental stress at both the local and the global level.

89. Research and initial commercialization experiments with products made from agricultural waste are under way in both developed and developing countries. Apart from the use of straw and other agricultural waste as raw material for the pulp and paper industry, and as feedstock for biomass fuels, as discussed above, there are many other new and promising areas for attaining economic and environmental benefits. For example, the projects financed by the AARC Center (see box 4) include the use of waste wool as a clean-up product for oil spills, turning waste animal fats into fuel and using milkweed as an alternative to cotton. (In the last case, commercial viability would require that this "troublesome weed" be cultivated.)

90. In the developing countries as well, research into finding economic use for natural waste products is relatively advanced. A study in the Philippines⁶⁷ has identified no less than 24 items developed in the country, the expanded production and utilization of which would help in reducing environmental stress. They include products made from rice wastes (building blocks and sodium silicate for cleaning materials and adhesives), banana peels (vinegar), coir dust (cation exchange resin for water treatment), forestry wastes (building materials) and fishery wastes (food flavouring). Some of these products are commercially available, some are still at an experimental stage, and some are thought to have export potential. Production, however, is mostly experimental and it is on a small scale even for those items sold on the domestic market. Expansion of

markets, including export markets, and of production could lead to scale economies and improve the commercial viability of several projects. Bottlenecks to increasing production include the lack of financial support for technical research, lack of capital for expansion, lack of knowledge and experience in the export business and lack of government support for product promotion and technology dissemination. Logistical difficulties in obtaining adequate supplies of major material inputs for full-scale production also hinder commercial scale operations.

IV. CONCLUSIONS AND POLICY ORIENTATIONS

A. Conclusions

91. The above review of products with claims to reducing environmental stress caused by current consumption patterns reveals that there is considerable potential for expanding their utilization. In many areas products with environmentally undesirable properties can be substituted by environmentally preferable ones. The problems to be surmounted in doing so are different for different products but can be classified into five groups.

1. Price competitiveness

92. Some environmentally advantageous products such as organically grown products items and biomass fuels are more expensive than the products that they could substitute. One of the main reasons for this is that environmental costs associated with the latter products are not included in their prices. This is particularly important for fuels but is also relevant for agricultural products. As the internalization of environmental externalities advances, however, this source of price disadvantage of environmentally preferable products should gradually diminish.

93. The initial outlays needed for changing production practices play an important role in raising costs, particularly for organic products. Necessary expenditures for certification are also a significant factor in this respect. In the case of recycled materials, the sorting and upgrading of waste and scrap is an important cost factor. Costs associated with modifying traditional technologies in cases where the environmentally preferable alternative is an input to the manufacturing process may also be considered as impairing the competitiveness of these products. A similar constraint may be mentioned for biomass fuels as well, since they sometimes require modified combustion engines. In both cases, however, experts claim that the issue is more a reluctance to change than economic considerations.

94. For some items such as products made from agricultural waste, production technologies are at an experimental stage and costs of production could fall drastically if commercial scale production is attained.

2. Information about quality

95. Particularly for products with potential uses as inputs in agriculture and industry, scientific information about their physical and chemical properties is indispensable for increasing competitiveness. The potential private users accustomed to traditional inputs are unlikely to initiate scientific inquiries about alternative inputs unless cost advantages are strongly expected or they are forced by regulatory measures or public pressure to change their inputs. Thus, it falls principally upon the producers of the environmentally preferable inputs as well as the public institutions or industry associations and NGOs in the consuming countries to provide the scientific data needed by the users.

3. Information about environmental advantages

96. Many of the claims to environmental advantages and contribution to reducing environmental stress are based on partial information and even anecdotal evidence. Undisputed scientific proof, which is very difficult or impossible to obtain, should not be a prerequisite for acceptance of a product as environmentally preferable. It could paralyse actions by binding them to endless study. Nevertheless, to increase competitiveness, more credibility is necessary for the claims of environmental advantages by many products. In some cases, such as organic produce, advantages have been extensively studied and the products are certified and labelled. However, environmental advantages at the downstream stages of a product's life cycle, in particular for recycled products and for industrial inputs, are usually less well documented. Moreover, many such products which are used as inputs in industry are not amenable to labelling schemes and need other means of assessment and information dissemination.

4. Marketing

97. Many of the products reviewed in the study are "new" products and introducing them to the market is an important issue. For several items such as non-wood forest products, marketing expenses are important cost elements because of the relatively small volume of trade. For some others such as organic foods and alternative wood products, new strategies are necessary to reach wider consumer groups and graduate from niche markets to mainstream markets. An important aspect of marketing, which would increase competitiveness considerably, lies in the provision of reliable supplies of consistent quality, especially for products used as inputs in production processes. For many products, collection from producers is an important stage in the marketing chain which influences crucially the quality and price of the product.

5. Government regulations and policies

98. Through regulations, financial incentives, and command and control measures, governments have a significant role to play in correcting the existing distortions which favour environmentally disadvantageous products. This is particularly important in the cases of recycled products and biomass fuels.

Equally important are sectoral policies such as agricultural subsidies which are a determining factor for the relative competitiveness of alternative products. Trade and sectoral policies also have a significant impact on the competitiveness of supplies from different origins. In developing countries, governmental policies are also vital for the development of indigenous scientific capacity. This capacity is critical for the development of commercially viable and environmentally preferable products and for the demonstration of the technical and environmental qualities of these products.

B. Policy orientations

99. The following policy orientations are formulated with a view to enabling developing countries to benefit from increasing environment-consciousness in the main markets, thereby improving their export earnings while contributing to reducing local and global environmental stress caused by current consumption patterns. In this context, ways and means to increase the competitiveness of products with environmental advantages will need to focus on the five main problems mentioned above. There are also some general policy considerations which address simultaneously a number of these problems.

1. Price competitiveness

100. (a) Policies and measures to internalize environmental externalities should be pursued at both the national and international levels. To be effective, such internalization needs to cover all products which are potential substitutes for each other. Cooperative approaches to multilateral internalization schemes, in particular for traded products, seem to be a particularly attractive vehicle in this context.

101. (b) To facilitate the adoption of environmentally preferable agricultural practices it would seem appropriate to provide financial assistance to cover transition costs. Given the financial constraints faced by developing countries, resources for such purposes would need to come in large measure from international institutions and/or the consuming countries. The distribution of such assistance could be organized through producer groups, including cooperatives, and could take the form of long-term loans to these groups, guaranteed by the government of the recipient country. Repayment could be linked to the prices of organic products produced. Similar financial arrangements and other types of cooperation or partnerships could be designed between importing firms and producers.

102. (c) The costs of certification need to be brought down. This could be done through the establishment of competent certification authorities in developing countries and the vesting in them of internationally recognized powers to certify products. Such authorities would require qualified personnel whose competence could be verified periodically by international inspection; there would accordingly be a need for assistance from developed countries and international organizations to train them.

103. (d) Technical research into reducing the costs of biomass fuel production should continue. Crops (such as sweet sorghum) which may be more suitable for

biomass fuel production, and technologies (such as splitting of sugar cane) which may be more cost-effective than the conventional ones should be seriously considered. In this connection, cost comparisons between biomass fuels and fossil fuels should take into account the existence of different technologies for producing the biomass fuels and different options (such as aquahol) for using them.

104. (e) Logistical and infrastructural support, for example, improvements in rural transportation systems and storage equipment and facilities, will contribute to bringing the costs down for many products.

2. Technical qualities

105. (a) Research on the technical qualities of environmentally preferable inputs that can be substituted in production processes is indispensable for improving their competitiveness. Such research can most cost-effectively be undertaken on a generic basis. Producers of the same or similar products could jointly embark upon such research to reap economies compared to the case in which each country engages individually in related work. As several products (such as natural fibres and inputs to the paper industry) are produced by both developed and developing countries, and the same research facilities can be used for several similar products, there is much scope for easily realizable co-operation. An important and easy step in this direction would be for developed country governments to take measures to facilitate access by developing country producers of raw materials to research facilities.

106. (b) When certain technical qualities of an environmentally preferable product do not fit satisfactorily the requirements of the industry, an effective focus of research could be on improving these qualities.

3. Environmental qualities

107. (a) There appears to be a need for methodological improvements in life cycle analysis to permit serious use of such methods to ascertain the environmental advantages and disadvantages of products, particularly those (such as recyclables) that have important impacts on global trade and industry patterns.

108. (b) Credible research into the environmental attributes of products needs to be expanded, especially for products which are not subject to certification and ecolabelling schemes. Although ideally life cycle analyses and environmental impact assessments would be appropriate, initial research could usefully focus on the particularly strong and weak points of such products with a view to emphasizing the former and improving the latter.

109. (c) Publicizing the importance of environmental benefits that occur mainly in the producing countries and those which are not immediately obvious to the consuming public (as in the case, for example, of forest friendly products and

products made from wastes), would be an important step towards increasing the competitiveness of environmentally preferable products. In order to raise the consciousness of consumers, it would seem useful if the NGO community and other public pressure groups such as the media were involved in such activities.

110. (d) In those cases where increasing supplies can imply environmental degradation (such as for non-wood forest products), cooperation of producers with independent observers would help not only to ensure the sustainability of production but also to publicize it and thus inspire confidence among potential customers.

4. Marketing

111. (a) Increased competitiveness and more widespread consumption of organic products and non-wood forest products, is likely to require acceptance of such products by large distributors and supermarkets in developed countries. This would require organizational changes on the supply side to secure the continuity and quality of supplies. Such changes are in turn likely to require technical and organizational assistance, e.g. for the reduction of post-harvest losses and storage problems.

112. (b) Market awareness requires that developments in the consuming countries, in terms of consumer interest and rules and regulations, particularly for fuels and recycled products, be closely followed. As this is a product-related activity, the cooperation of international organizations and possibly commodity bodies would be a cost-effective approach.

113. (c) Generic promotion and concerted marketing activities for items such as agricultural raw materials, wood products, and non-wood forest products would seem to be a useful tool for increasing competitiveness.

114. (d) The development of product data sheets merits being encouraged as this can facilitate acceptance of new products by industry.

115. (e) Given that environmental conditions change from country to country, and that many environmental problems are location specific, certification and ecolabelling schemes need to provide equivalences for environmental advantages in different locations.

5. Government regulations

116. (a) Government regulations and policies should, first and foremost, eliminate the explicit or implicit subsidies given to environmentally undesirable products and practices.⁶⁸

117. (b) In some developing countries measures to define secure property rights will provide incentives for improving environmental protection at the production sites, particularly in the case of products from forests as well as for agricultural production in general.

118. (c) The competitiveness of natural products with environmental advantages would be increased by governmental review, and appropriate revision, of industry and trade standards which may be based on established practice rather than technical requirements and which may act as barriers to entry for such products.

119. (d) In many cases government procurement practices can act as an important signal for the private purchasers. An obvious and powerful incentive for the expanded use of environmentally preferable products would therefore be the adoption of provisions to give preference to such products in government procurement. By enlarging the production this could also lead to economies of scale, reduce costs and improve the competitiveness of such products. Action taken in this respect includes the Federal recycling and procurement policy of the United States as well as the proposed legislation that would require the United States Government Printing Office to use soy-based ink in Federal documents instead of petroleum-based inks.⁶⁹

6. General considerations

(a) Importance of a multifaceted approach

120. In order to increase the competitiveness of natural products with environmental advantages, the private and public sectors of producing and consuming countries as well as the academic and NGO communities need to act in concert. Each of these actors has a specific role to play, ranging from establishing the requisite regulatory and policy framework to generating and disseminating information at all stages of the product life cycle. Competent international organizations can play a very important role and act as catalysts in this respect, bringing together the various actors.

(b) The need for an organized information base

121. An electronic information system on environmentally preferable products covering their principal characteristics and market developments would be instrumental in expanding the awareness of key actors. Several modalities can be envisaged for this system. It could be an independent entity, linked to the existing databases on products⁷⁰ or systems such as UNCTAD's MICAS (Microcomputer-based Commodity Analysis and Information System), or be associated with information systems such as UNEP's International Cleaner Production Information Clearing House. It should be mentioned that work has been initiated in UNCTAD on recycled materials, for which information is extremely scarce and government regulations differ widely between countries and change frequently.

(c) Funding needs

122. Development of environmentally preferable products, improvements in their qualities, establishment of certification schemes, and amelioration of environmentally undesirable effects as well as marketing of these products by developing countries require substantial amounts of finance. Given the contribution that expansion of production and trade of these products can make to the sustainable development process, it would seem appropriate that provision of finance for these purposes be included in official development assistance

programmes. Consideration might be given to the creation of a trust fund which would provide venture capital to developing country firms interested in improving and commercializing environmentally advantageous products. This entity could be modelled after the United States Department of Agriculture Alternative Agricultural Research and Commercialization Center and cooperate with the private sector in developing countries.

(d) Technical cooperation among developing countries

123. Many of the issues mentioned above, ranging from scientific to marketing problems, are relevant to most developing countries producing the environmentally preferable products. Cooperation among these countries would reduce the costs to be borne by each of them. Moreover, as larger supplies will help, through increased exposure, in acceptance of these products by the users there is much to be gained from cooperation. There is, therefore, there is a need to promote both exchange of experience and joint research and marketing efforts. International organizations could have an important catalytic role to play in this respect.

(e) Further work and development implications

124. In order to provide a sound basis for national and international policies with a view to increasing the competitiveness of natural products with environmental advantages, it would be useful for the Standing Committee on Commodities to keep under constant review the developments concerning the issues identified in this study. Further analytical work in the UNCTAD framework could be undertaken in two directions, with a commodity and a country focus. There seems to be considerable scope for technical cooperation as well.

125. With regard to the commodity focus, a limited number of products or product groups could be selected and in-depth analyses could be undertaken regarding opportunities for and constraints to, their increased utilization and trade, and the implications for developing countries. Because of the sheer size of their actual or potential markets and the paucity of related information on trade and development aspects, reusable and recycled materials and biomass fuels are obvious candidates in this respect. Specific aspects of organic production and trade in organically grown products, such as certification, principles and costs of certification, also merit attention in this context.

126. Work should proceed with a country focus on other products such as natural agricultural inputs, non-wood forest products and products made of agricultural waste. This should include the analysis of implications of increased production and exports of environmentally preferable products on the development prospects of specific countries. It should also aim at providing information to assist the developing countries in better assessing their potential in this area and identifying the bottlenecks. Least developed countries and countries in Africa seem to merit priority attention in this respect, e.g. in terms of exchange of experiences with developing countries which are relatively advanced in the production and export of natural products with environmental advantages.

127. Technical assistance could include, apart from assistance in terms of analysis and policy development on a country basis, the organization of round-table meetings on specific products, which would bring together public and

private sector representatives of the producer and consumer countries as well as the NGO and academic communities. The purpose would be to increase the producers' and consumers' awareness of opportunities and bottlenecks in respect of these products, to expand the information base and to improve direct contacts. These meetings would seem to be of the highest value for products relatively less well known by the general public.

Notes

1. Although "environmentally preferable" is the most appropriate term, "environmentally advantageous" and "environment-friendly" are also used interchangeably in this study.
2. In the context of discussions on environment-related trade measures, a similar distinction is made in terms of process and product standards.
3. Reference can be made to one particular type of input: energy. In most life cycle analyses, a production process is considered as more environment-friendly when the energy use is lower. However, the environmental characteristics of energy are determined by the way it is generated. For example, hydroelectric or agro-based fuels have different environmental impacts from fossil fuels. Therefore, energy use, undifferentiated by source, cannot uniformly be considered as unfriendly to the environment.
4. There are also important environmental impacts at the distribution and marketing stages such as that caused by transportation. Thus, products produced at places near the markets have an advantage in this respect over those produced far away. This study does not focus on this stage of the life cycle although it may be of considerable importance in some cases.
5. Wiemann, J., "Green protectionism - a threat to third world exports? The case of Indian leather and textile exports facing tighter environmental standards on the German/European market", mimeographed, September 1993, quoting certain opinion polls.
6. Cairncross, F., Costing the Earth, the Challenge for Governments - the Opportunities for Business, Harvard Business School Press edition, 1993, pp. 191-192.
7. Salzhauser, A. L., "Obstacles and opportunities for a consumer ecolabel", Environment, vol. 33, No. 9, p. 10.
8. International Environment Reporter, 6 April 1994, p. 318.
9. The reuse of goods and materials is an extension of their utilization period through the design of long-life goods and the introduction of service loops to extend an existing product's life by repair, reconditioning or technical upgrading.
10. Recycling is the processing of materials collected and separated from waste to produce marketable goods.
11. According to various life-cycle analyses for reusable clothing, for instance, far more resources are used by consumers in washing, drying and ironing the clothes than in their re-manufacturing/recycling. This is even true for polyester fibres. J. Nash, M.D. Stoughton, "Learning to live with life cycle assessment", Environmental Science and Technology, vol. 28, No. 5 (May 1994), p. 236A.
12. The recycling of ferrous scrap leads to energy savings of 25-65 per cent; the complete recycling of one ton of flat steel products substitutes for 1.5 tons of iron ore and 0.5 tons of coke; recycling of ferrous scrap leads to 30 per cent lower air emissions than treatment of pig iron and about 60-70 per cent lower emissions into water. UNCTAD, "Enhanced recuperation and recycling: implications for primary commodity

producers in developing countries - the case of ferrous scrap versus iron ore" (UNCTAD/COM/43), Geneva, 10 June 1994, p. 6.

13. Pushed beyond a certain level, paper and board recycling leads to the production of sludge whose sheer volume (in Canada, for example, one ton of recovered paper yields about 0.66 tons of sludge) and composition (broken fibre, fines and ink, semi-solubles such as starch and coatings, and non-solubles, such as fillers) make its disposal very difficult. On the other hand, large-scale paper and board recycling reduces the demand for new wood-fibres, giving commercial woodland owners less incentive to maintain their forests. S. Nilsson, Environmental Impacts of Waste paper recycling: a Feasibility Study, Earthscan Publications, London, 1993; G. Elliot, "Trade implications of recycling of newsprint", paper prepared for the OECD Workshop on Life-Cycle Management and Trade, Paris, 20-21 July 1993, p. 5; OECD, Recovery and recycling of packaging material: trends and industry impact, final report of the Ad Hoc Working Party on Pulp and Paper, DSTI/SI/IND/PP(92)4/REV3, Paris, 9 November 1993, p. 26.
14. Loss-making recycling schemes are numerous. S. Fairlie, "Long distance, short life: why big business favours recycling", The Ecologist, vol. 22, No. 6 (November/December 1992), p. 280). However, environmental costs associated with the production of virgin materials are not included in their prices either.
15. UNCTAD/COM/43, op.cit.
16. International Environment Reporter, Washington, D.C., 9 February 1994. Social charges for employers in Western Europe can add up to 60 per cent of a young employee's salary. International Environment Reporter, Washington, D.C., 1 December 1993, p. 891.
17. In Argentina, IBM recycles three quarters of its waste because local facilities do not meet its self-imposed tough requirements for waste disposal. International Environment Reporter, Washington, D.C., 19 May 1993, p. 368.
18. The question to be answered for each commodity in this respect is: Is the growth of primary commodity demand generated by quick economic expansion, in particular in countries such as China, India, Mexico, Indonesia and Viet Nam, sufficient to compensate for or override the part of demand met by secondary materials?
19. As for copper, for instance, the recycling rate is estimated at 50% for all developed countries, 38% for North America, 27% for Japan, 85% for Western Europe, and 45% for South-East Asia for 1991-92.
20. Our interest in this study is in biomethanol made from biomass.
21. Calculated from United States Department of Agriculture, "Emerging technologies in ethanol production", 1993, and "Bush fuels support by backing ethanol", Financial Times, 7 October 1992.
22. Some authors reject the idea that higher fossil fuel prices will help the introduction of biofuels because this perspective underrates the reaction of fossil fuel interests. They also recall that the technologies used to produce alternative fuels are constantly being upgraded. Moreover, the influence of the strong corporate interests at

stake in this matter should not be neglected.

23. "New uses to rescue EC oilseeds", World Commodity Report, 11 March 1993.
24. Ibid.
25. Comparable terms used include "ecological" and "biological".
26. FAO "Agrovoc Multilingual Agricultural Resources", 2nd ed. 1992.
27. United States Department of Agriculture, Report and Recommendations on Organic Farming, Washington, 1980.
28. These effects are likely to be eliminated in any case, as a result of strict standards and very careful testing.
29. Hamm, U., "Marketing strategies for organic products in China", mimeographed, 1994. C. Haest, "growing as partners into the 21st century", mimeographed, 1994.
30. Financial Times 30 April 1993 International Trade Centre, "Dissemination activities for coffee - an exporter's guide", 1993, p. 7.
31. Hamm, op. cit., pp. 4-5. Haest, op. cit., p. 44.
32. Press release of Krav (Kontrollföreningen för Ekologisk Odling), not dated.
33. Interview with chocolate manufacturers.
34. Aruoba, Celik, "Analysis of probable impact of EU ecolabelling program and related criteria on Turkish textiles and garments exports to European markets". Paper prepared for the Workshop on Ecolabelling and International Trade, Geneva, 28-29 June 1994.
35. Haest, op. cit., p. 32. Wong, Jennifer, "Organic coffee: gearing up for a high-quality product", APROMA/Bimonthly Review, No. 26, 1993 p.28. UNEP, "Benefits of diversity - an incentive toward sustainable agriculture", various chapters. International Cotton Advisory Committee, "Organic cotton growing", attachment II to SC-N-404, 26 May 1994.
36. Hamm, op. cit., p. 6
37. Haest, op. cit.
38. van Dam, J.E.G., van Vilsteren, G.E.T., Zomers, F.H.A., Shannon, W.B., Hamilton, I.T. Increased Application of Domestically-produced plant Fibres in Textiles, Pulp and Paper Production, and Composite Materials. Prepared on behalf of the Commission of the European Communities DG XII, not dated, p. 8.
39. FAO, Committee on Commodity Problems, Intergovernmental Group on Hard Fibres, twenty-fifth session, "Environmental improvement possibilities in hard fibre operations of producing countries", CCP: HF 91/9, June 1991. Braungart, M., Engelfried, J., Hansen, K., Mulhall, D., Neumann, M., Jute and Polypropylene: Environmentally Intelligent Products? Comparative Impact Assessment, Hamburg, October 1992.

40. FAO, Committee on Commodity Problems, Intergovernmental Group on Jute, Kenaf and Allied Fibres, twenty-eighth session, "Developments in regulatory measures affecting packaging", CCP: JU 92/8, August 1992.
41. Ibid. Information Note on Degradable Plastics. CCP: JU 92/4, June 1992.
42. Harsch, J. New Industrial Uses, New Markets for U.S. Crops: Status of Technology and Commercial Adoption, prepared for United States Department of Agriculture Cooperative State Research Service, Office of Agricultural Materials, August 1993, p. 58.
43. van Dam, J.E.G. et. al., op. cit., p. 46.
44. Ibid., p.94.
45. Ibid., p. 40.
46. Sen Gupta, A.K. "Geotextiles: opportunities for natural-fibre products" International Trade Forum, January-March 1991, p. 12.
47. GADSA Limited London, Investing in Rubberwood Processing: Opportunities, Constraints and implications of Horizontal Integration for the Rubber Industry, background paper No. 5, prepared for the Workshop on Global Development of the Rubberwood Industry, Kuala Lumpur, 23-24 September 1993, p.12.
48. In the Philippines, for example, by the Forest Products Research and Development Institute, and by the Forest Research Institute of Malaysia.
49. UNIDO, The potential role of rubberwood in the forest economy of rubber producing developing countries, background paper No.2, prepared for the Workshop on Global Development of the Rubberwood Industry, Kuala Lumpur, 23-24 September 1993, p. 9.
50. ITC, A study on the rubberwood industry in Malaysia, Background paper No. 1, prepared for the Workshop on Global Development of the Rubberwood Industry, Kuala Lumpur, 23-24 September 1993, p. 30.
51. Indufor, Oyd, - Rubberwood: A study of world supply potential, background paper No. 3 prepared for the Workshop on Global Development of the Rubberwood Industry, Kuala Lumpur 1993, p. 49.
52. Government of the Philippines, "Technology transfer/commercialization of selected cocowood utilization techniques", project proposal to the International Tropical Timber Organization, PD 17/92 Rev. 4(1).
53. UNIDO, op. cit., p.4.
54. The last figure is bound to rise as log extraction in Sabah and Sarawak is reduced.
55. ITC, A study on the rubberwood industry in Malaysia, mission report by Dr. Lew Wing Hing submitted to the Workshop on Global Development of the Rubberwood Industry, Kuala Lumpur, 23-24 September 1993. Background paper No. 1, p. 2.

56. Panayotou, T. "Introduction: multiproduct forest management - a key to sustainability?", in International Tropical Timber Organization (ITTO), Status and potential of non-timber products in the sustainable development of tropical forests, Proceedings of the international seminar held at Kamakura, Japan, 17 November 1990, p. 3.
57. Gentry, A.H., "Tropical forest diversity vs. development: obstacle or opportunity?", in ITTO, op. cit., p. 67.
58. May, P., "Measuring sustainability: forest values and agropastoral expansion in Brazil", prepared for the International Expert Meeting on Sustainable resource management and Resource Use, Noordwijk, the Netherlands, 3-4 June 1993.
59. Panayotou, T., op. cit., p. 4.
60. Sayer, J.A., "Using non-timber products to support forest conservation programmes", in ITTO, op. cit., p. 39.
61. Gentry, A.H., op. cit. p. 65.
62. Dove, M.R., "A revisionist view of tropical deforestation and development", Environmental Conservation, v. XX (1), Spring 1993, p. 23.
63. This part has benefited extensively from J.W. Clay, and C.R. Clement, "Selected species and strategies to enhance income generation from Amazonian forests", prepared for FAO, 1993.
64. National Research Council, Neem: Tree for Solving Global Problems, Washington, D.C., 1992, pp. 1-2.
65. FAO/WHO Codex Alimentarius Commission, Joint FAO/WHO Food Standards Programme, "Consideration of biologically or organically produced foods", prepared by the Government of Canada, Alinorm, 91/37, annex II.
66. National Research Council, op. cit., p. 15.
67. Israel, D.C., Trabajo, F.M.C., and Nayve, C.M., "The production, utilization and trade of environmentally preferable products in the Philippines", prepared for UNCTAD (forthcoming).
68. In this respect, see "The effects of the internalization of external costs on sustainable development", report by the UNCTAD secretariat, TD/B/40(2)/6, 7 February 1994.
69. Agricultural Outlook, July 1994, p. 14.
70. For a list of such databases see B. Ancel, and S. Srivesta, "Market information at your fingertips", International Trade Forum, No. 4/1993.